MODERN MACHINE TOOLS

THE JOHN BERTRAM & SONS CO.
LIMITED.
DUNDAS, ONT., CANADA.

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Modern Machine Tools

THE JOHN BERTRAM & SONS CO., LIMITED

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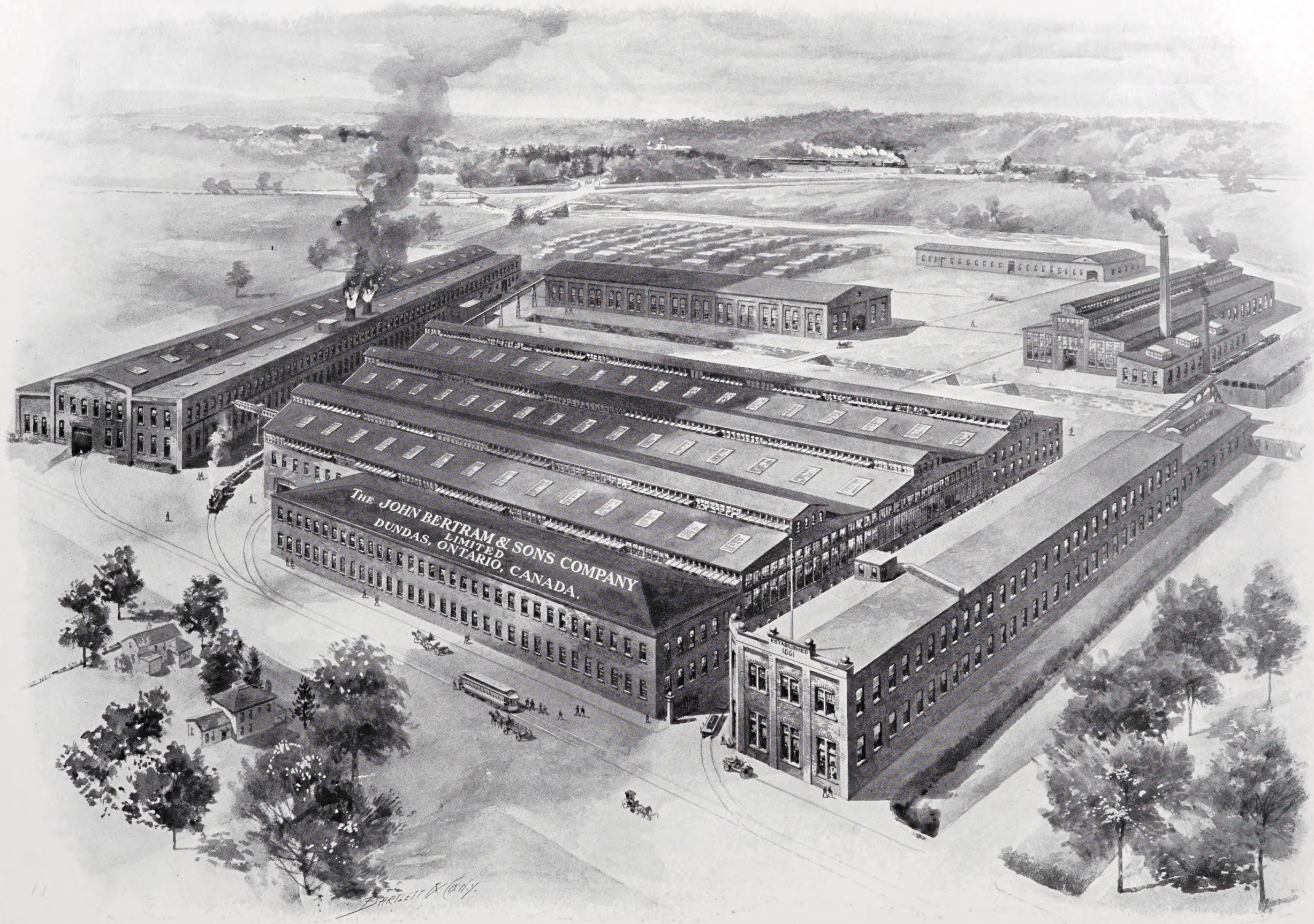
THE JOHN BERTRAM & SONS COMPANY
LIMITED
DUNDAS, ONTARIO, CANADA.
ESTABLISHED
1861
BARTLETT & CO. LY.

INTRODUCTION

IN presenting this catalogue to those who have to do with the purchase and operation of machine tools, we shall endeavor to make as brief as possible, that least essential and most insuppressible catalogue adjunct—the introduction.

The story of our development from 1861 to the present time is an interesting one, but a long one, and suffice to say here that from a humble beginning there has grown the largest iron working machine tool plant in Canada. This plant is equipped with all the modern appointments and devices which facilitate the handling of work, and special sidings give us direct connection with the principal railroads. Associated with us are skilled machinery designers and mechanical engineers.

The catalogue is divided into sections, each showing a separate class of machinery. It will be noted that we build as wide a range of machine tools as any single concern in America. Our locomotive and car shop tools are attracting world-wide attention by their exceptional size, weight and power. As we build special machines which are not shown in this catalogue, and as we are constantly improving our standard designs to meet the changing demands of modern usage, we invite inquiries at all times for photographs and descriptions. We also extend to our friends a cordial invitation to visit our works.

As to this book itself, we have tried to make it commensurate with the standard of machine tools which it catalogues, and we request a careful inspection of its pages.

Yours respectfully,

THE JOHN BERTRAM & SONS CO., LIMITED

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LATHES

ENGINE LATHES

WE illustrate on the following pages a line of engine lathes ranging from 12 to 28 inches, all of which are standard for machine shop use.

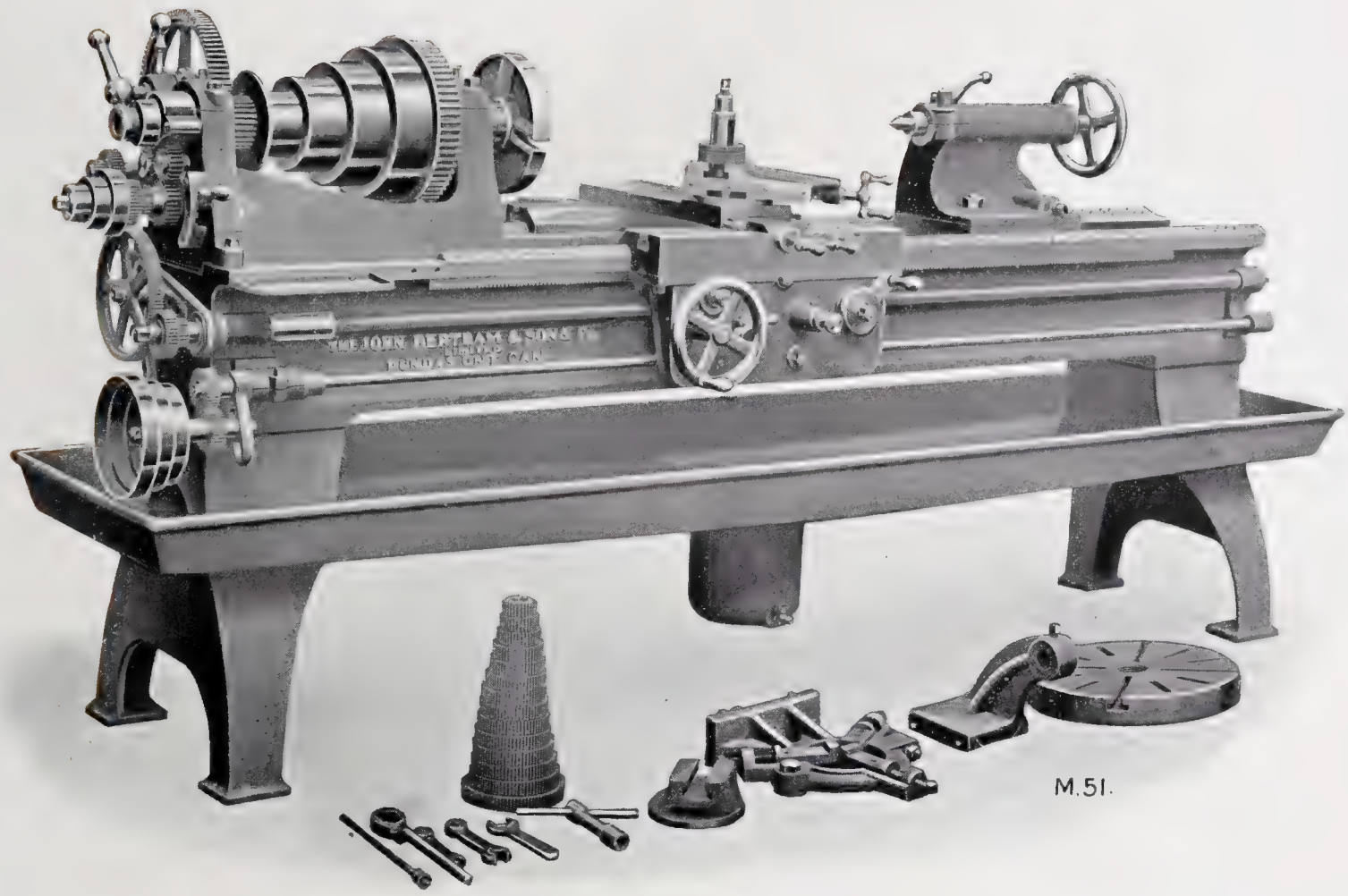
The headstocks are massive in design, insuring stiffness and preventing all vibration and chatter. The spindles are hollow, made from crucible steel, and run in bronze lined bearings, with provision for taking up wear. The carriages have long bearings on the beds, are gibbed both front and rear and provided with power cross and longitudinal feeds operated by independent rod or screw. The tailstocks have graduated set-overs for taper turning. They are of curved form, allowing the compound rest to swivel to an angle of 90 degrees. The beds are of deep section, strongly braced at close intervals by hollow ribs, are sufficiently wide to support the tool-slide without the latter overhanging the front side when turning the full swing of lathe, and may be made any desired length.

The 20-inch lathe and all smaller sizes are furnished when so ordered with a turret mounted on an independent slide having automatic power-feed, also quick hand-adjustment operated by pilot-wheel.

These lathes are regularly furnished with follow- and steady-rests, change gear, large and small face-plates and reversing countershaft.

DIMENSIONS

Size	Swing Over Bed	Swing Over Carriage	Usual Length of Bed	Turns Between Centers	Diameter of Hole Through Spindle	Friction Countershaft-Pulleys		Code Word
						Dimensions	Revolutions	
Inches	Inches	Inches	Feet	Ft. & In.	Inches	Inches		
12	14	[illegible]	5	2—2	15 16	[illegible]	190	GLUMPY
14	16	10	6	[illegible]	1–5 16	10 x 3½	160	GLUPSIT
16	18½	12	6	2—4	1–5 16	10 x 4	120	GLUTAMIC
18	20	11	8	3—10	1–11 16	12 x [illegible]	240	GLUTEAL
20	21½	15	10	5—4	1–13 16	14 x 5	115	GLUTIAM
24	25	16½	12	6—8	2–1 16	15 x 5½	115	GLUTINA
28	28½	20	12	6	2–1 16	20 x 6	135	GLUTINANS

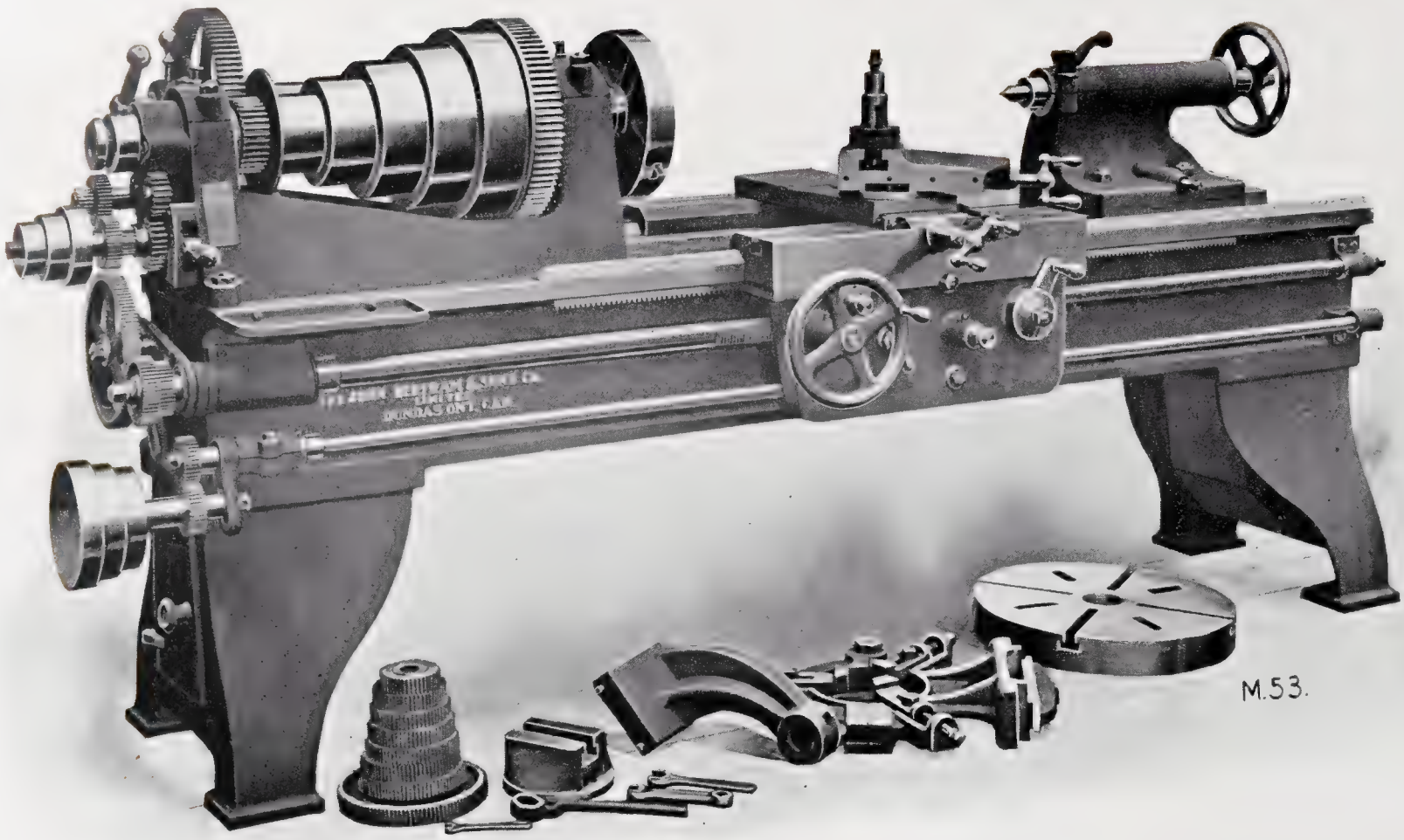


16-INCH ENGINE LATHE

No. M-51 A

SWING over the bed, 18½ inches. Over the carriage, 12 inches. With 6-foot bed turns between centers, 2 feet 4 inches. Equipped with independent screw-cutting and turning-feeds, power crossfeed and pan surrounding bed.

Code-Word . . . . . GLUTAMIC
Code-Word, for oil pan . . . . . GNOCCO

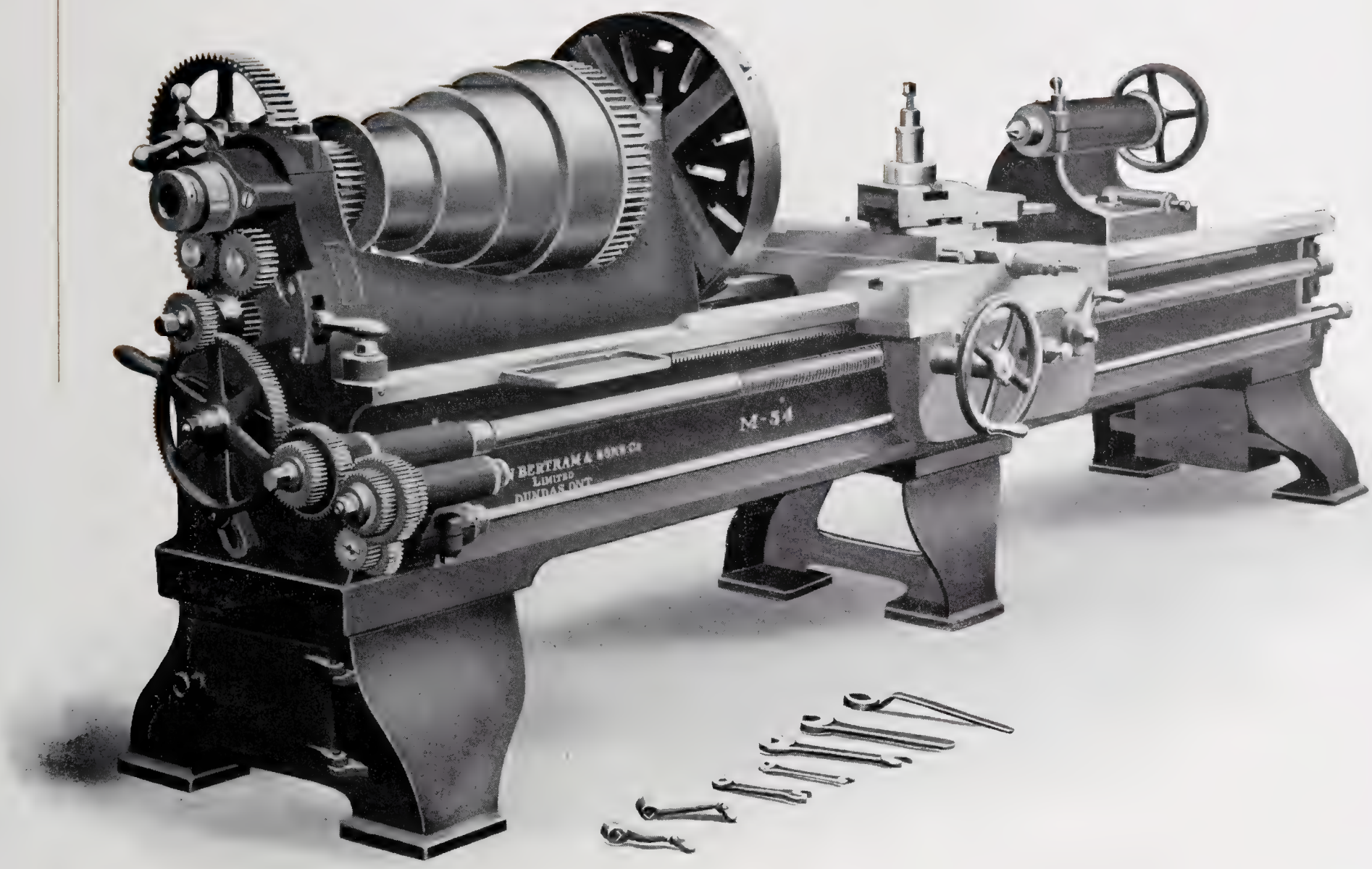


20-INCH ENGINE LATHE

No. M-53

SWING over the bed, 21¾ inches. Over the carriage, 13⅞ inches. With 10-foot bed turns between centers, 5 feet 4 inches. The hole through the spindle is 1 13/16 inches in diameter.

Code Word . . . . . GLUTIAM

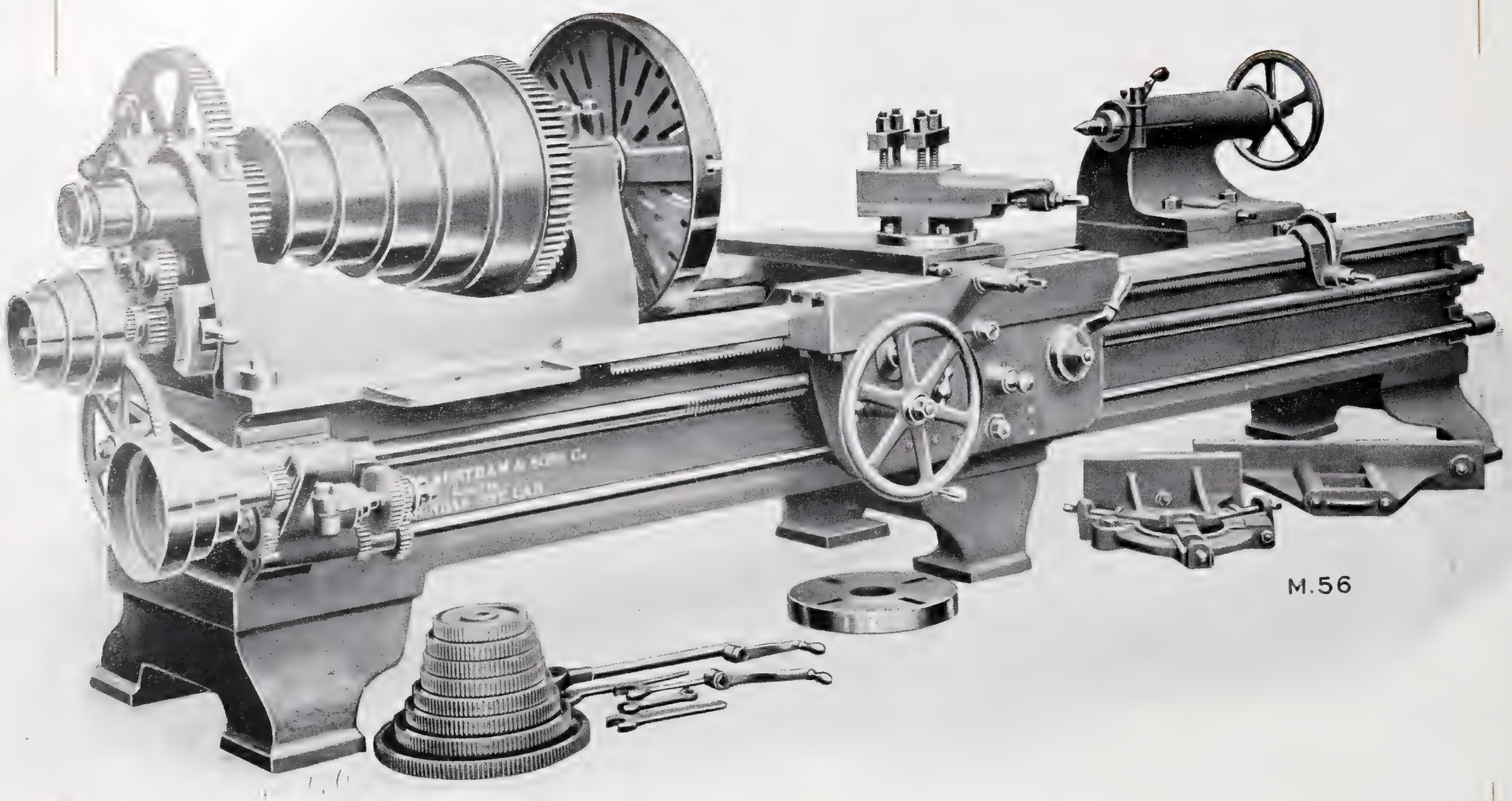


24-INCH ENGINE LATHE

No. M-54

SWING over the bed, 25 inches. Over the carriage, 16½ inches. With 12-foot bed turns between centers, 6 feet 8 inches. The lathe is supplied with a screw of large diameter for thread cutting and an independent rod for turning, both having positive geared feeds with three changes operated by plunger. The face-plate is driven from a large diameter cone for 3¾ inch belt, which in turn is driven through back gear, enabling the lathe to carry the heaviest cuts made possible by modern tool steel.

Code-Word . . . . . GLUTINA



28-INCH ENGINE LATHE

BACK GEARED

No. M-55

SWING over the bed, 28½ inches. Over the carriage, 20 inches. With 14-foot bed turns between centers, 6 feet. The live spindle is a steel forging and runs in bronze bearings with provision for wear. The cone has five wide belt steps of large diameter, back geared and has 10 changes of speed. The bed is sufficiently wide to support the tool-slide without the latter overhanging the front side when turning the largest diameter. The carriage is gibbed to the outside edges of the bed and can be clamped when crossfeeding. Screw-cutting gear, steady head, wrenches and countershaft are provided.

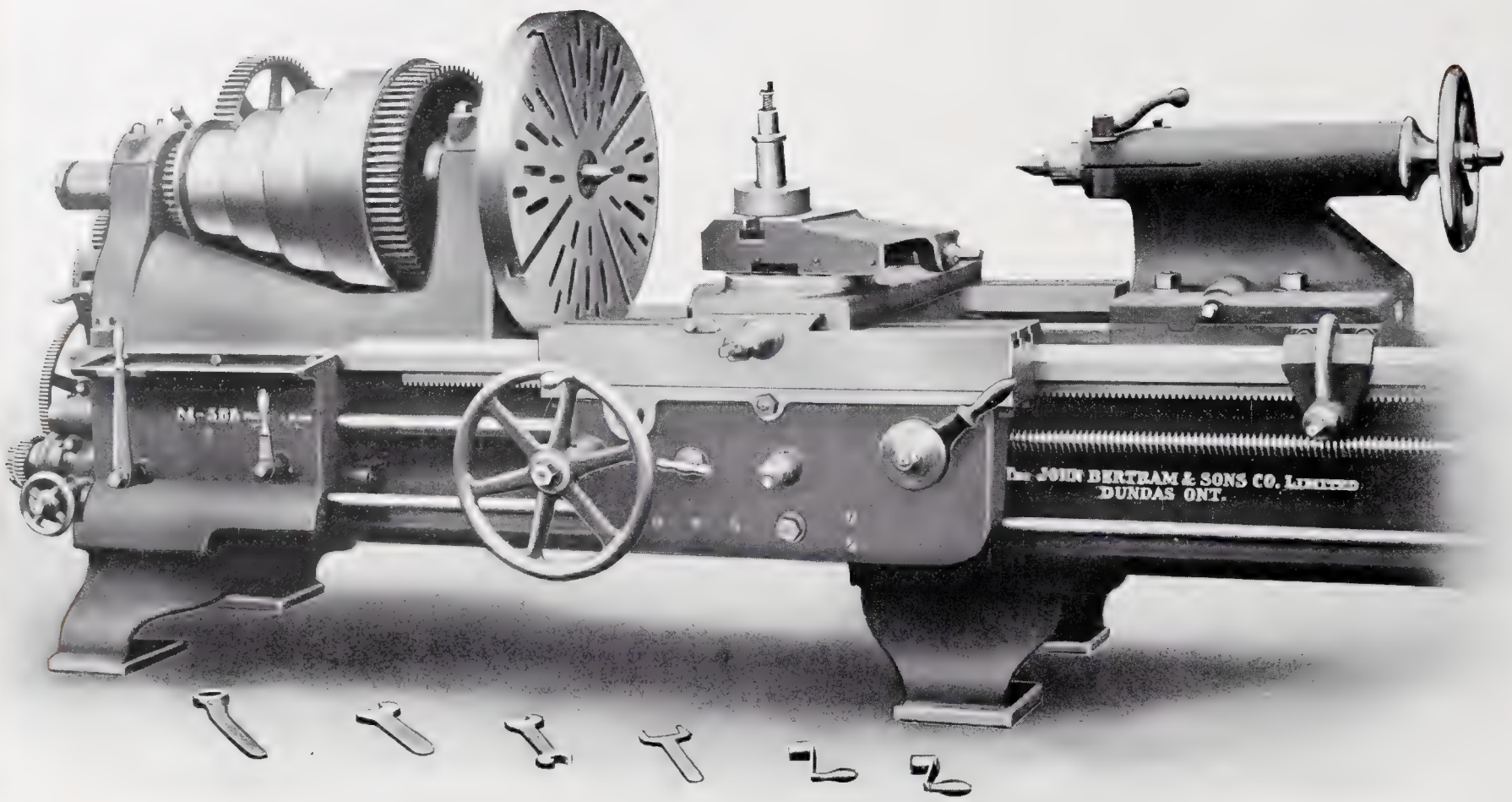
Code-Word . . . . . GLUTINANS

HEAVY ENGINE LATHES

WE illustrate on the following pages a line of heavy, powerful lathes of new design, embodying the most improved principles and built in the best possible manner to insure durability. All parts are calculated to withstand the heaviest duty imposed by modern high speed tool-steel. The carriages are fitted with compound swivelling tool-slide, and have screw-cutting attachment and power longitudinal and crossfeeds. All feeds are entirely independent of each other. The direction of the feeds can be changed at the carriage. The beds are of deep section, strongly braced at close intervals by hollow ribs. They are sufficiently wide to support the tool-slide without the latter overhanging the front side when turning the full swing of lathe, and may be made any desired length. Each lathe is provided with steady rest, a full set of screw-cutting gear, countershaft and wrenches. These lathes may be driven to advantage by independent motor.

DIMENSIONS

Size		Usual Length of Bed	Turns between Centers	No. of Spindle Speeds	Countershaft-Pulleys		Code-Word
	Over Bed	Over Carriage			Dimensions	Revolutions	
Inches	Inches	Inches	Feet	Ft. & In.		Inches		
[illegible]	32	20	14	7—6	10	22 x 6	80	GLUTINARIS
32 "	34	22	14	7—2	10	22 x 6	80	GLUTINATO
36 T. G.	[illegible]	26	14	6—3	15	24 x 6½	80	GLUTINAVO
42 "	44½	[illegible]	16	6—8	15	24 x 7½	[illegible]	GLUTINENT
48 "	50	42	16	6	[illegible]	24 x 7	157 & 200	GLUTINETIS
54 "	56	48	16	6	30	24 x 7	150 & 190	GLUTINOR
60 "	62	53	18½	8—4	[illegible]	30 x 7	145 & 185	GLUTIO
72 "	73	56	20	[illegible]	30	30 x 7	140 & 160	GLUTISSE

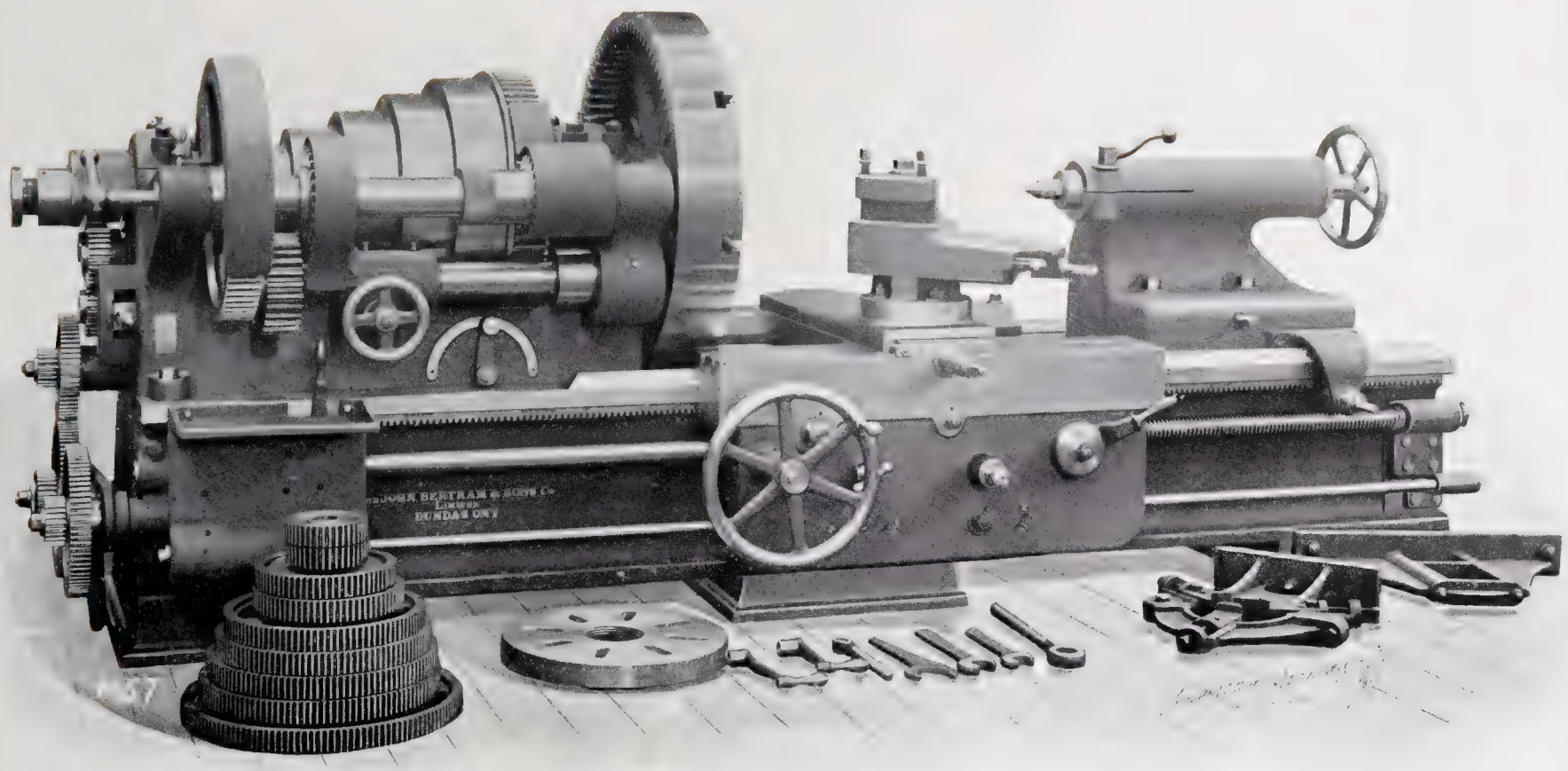


30-INCH ENGINE LATHE

No. M-56 B.

SWING over the bed, 32 inches. Over the carriage, 20 inches. Turns between centers with 14-foot bed, 7 feet 6 inches. In the machine illustrated the face-plate is driven from a cone of large diameter, having four speeds carrying 5-inch belt, which in turn is strongly back geared, and with countershaft speeds supplied, gives 16 changes of speed. The lathe is supplied with lead-screw for thread-cutting and rod for turning, each being entirely independent, with six changes of power cross and longitudinal feeds without changing gear.

Code-Word . . . . . GLUTINARIS



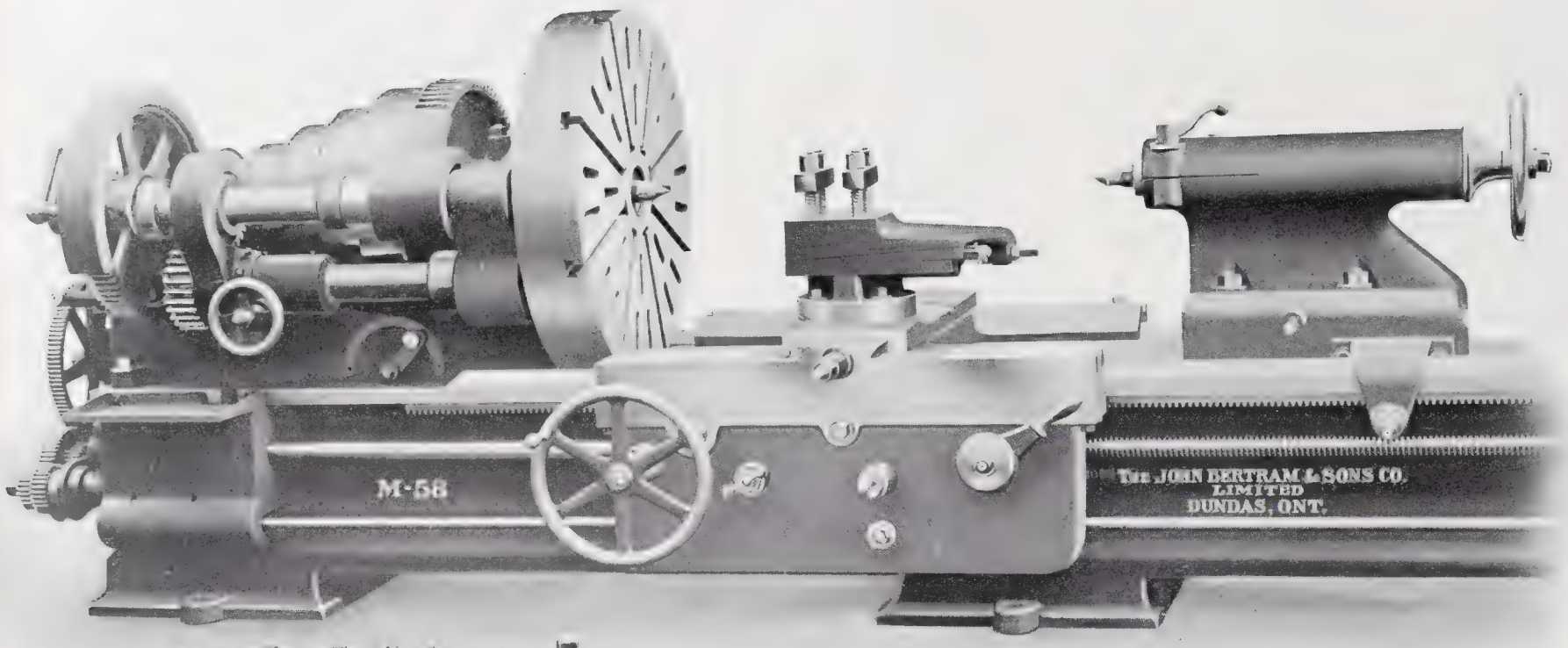
36-INCH ENGINE LATHE

TRIPLE-GEARED

No. M-57

SWING over the bed, 38 inches. Over the carriage, 26 inches. Turns between centers with 14-foot bed, 6 feet 3 inches. The live spindle is a steel forging to which the face-plate is bolted, and with internal gear has 15 changes of speed. The bed is sufficiently wide to support the tool-slide without the latter overhanging the front side when turning the largest diameter. The carriage is provided with compound-swivelling tool-slide having power cross and longitudinal feeds. Screw-cutting attachment and feeds are connected to the live spindle by three gears and a sliding key, giving three changes without changing gear.

Code-Word. . . . . GLUTINAVO

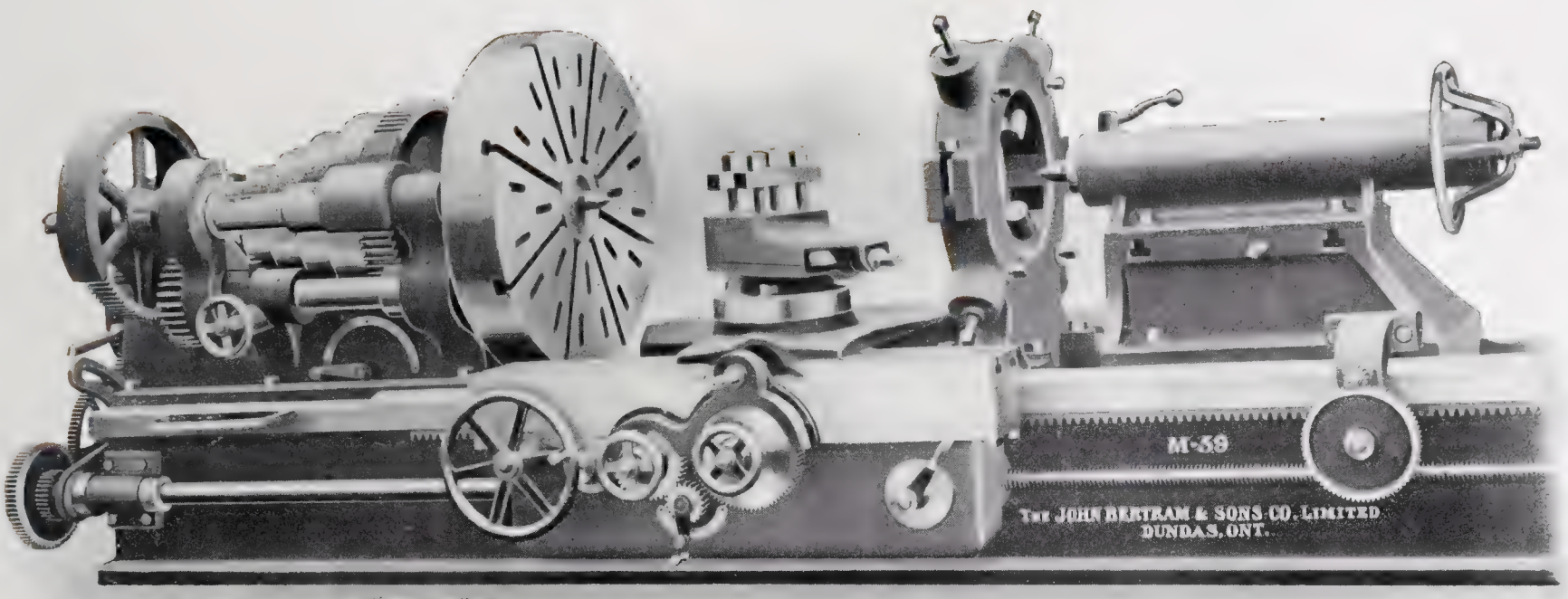


42-INCH ENGINE LATHE

No. M-58

SWING over the bed, 42½ inches. Over the carriage, 25 inches. With 16-foot bed turns between centers, 6 feet 8 inches. The cone is mounted on the live spindle, which is a steel forging. It is strongly back geared into the face-plate, thus affording 15 changes of speed. The carriage has a long bearing on the "V's" and is provided with compound-swivelling tool-slide with power cross and longitudinal feeds, and six changes of either turning or screw-cutting feeds without changing gears.

Code-Word

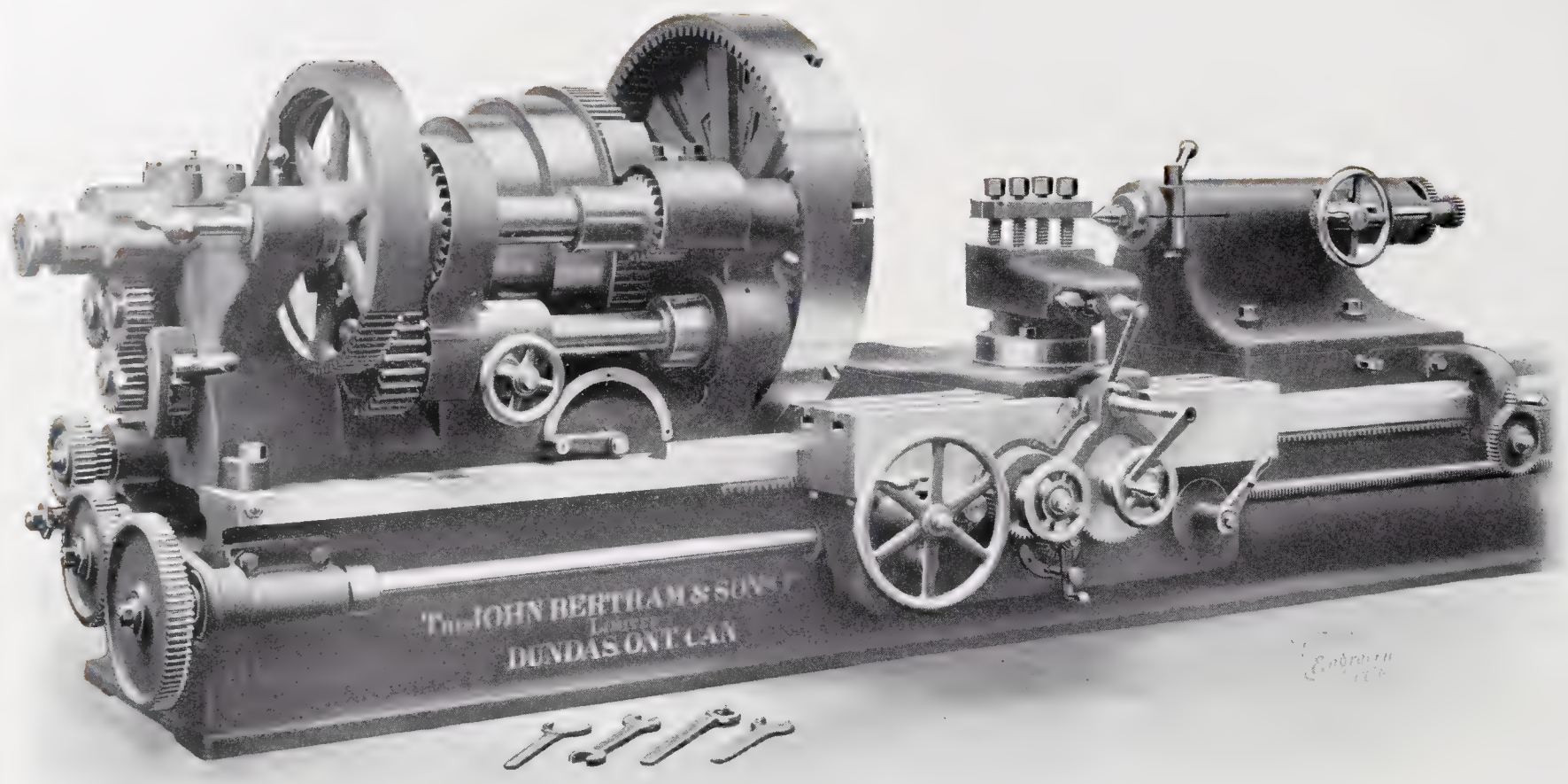


48-INCH ENGINE LATHE

No. M-59

SWING over the bed, 50 inches. Over the carriage, 32 inches. Width of bed turns between centers, 6 feet. The cone is mounted on a large forged steel spindle which runs in bronze bearings with provision for taking up wear. It is powerfully back geared and triple geared into face-plate, giving 30 changes of uniformly increasing speeds. The feed mechanism is substantial and conveniently arranged. All feeds are automatic and independent of each other. Three changes of feeds are provided for screw cutting or turning without changing the gears. The carriage is provided with compound-swivelling tool-slide having power cross and longitudinal feeds.

Code-Word . . . . . GLUTINETIS

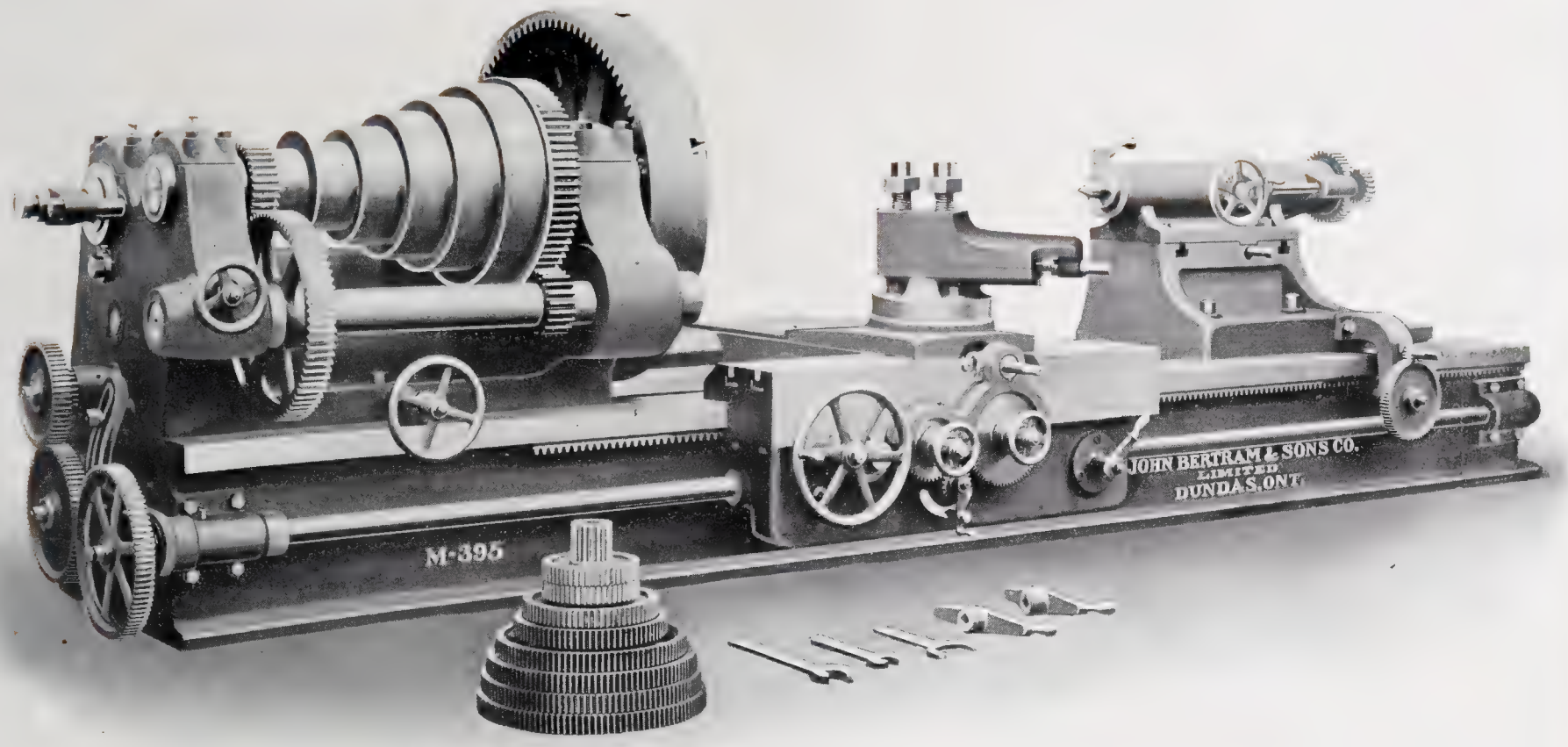


54-INCH ENGINE LATHE

No. M-401

BUILT for the heaviest cutting with modern high-speed tool steel. Swing over the bed, 56 inches. Over the carriage, 48 inches. Turns between centers with 16-foot bed, 6 feet. The spindle is a steel forging and has 30 changes of speed, five of which are driven by large face-plate gear and not through the spindle. The carriage is provided with compound-swivelling tool-slide, having power cross and longitudinal feeds. All feeds are automatic and independent of each other.

Code-Word . . . GLUTINOR

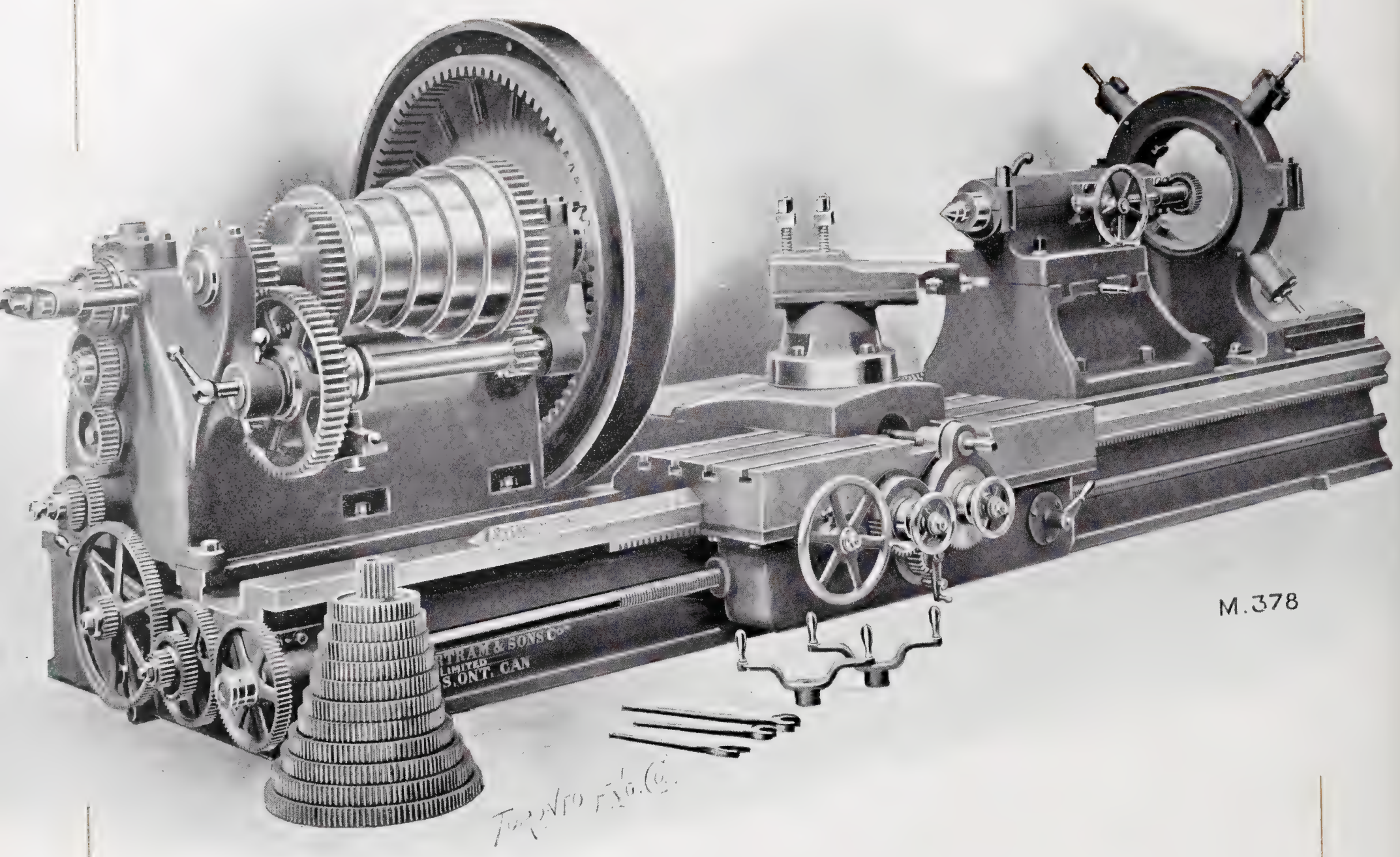


60-INCH ENGINE LATHE

No. M-395

THIS lathe is built for heavy duty. Swing over the bed, 62 inches. Over the carriage, 53 inches. Turns between centers with 18½-foot bed, 8 feet 4 inches. The live spindle is a steel forging to which the face-plate is bolted. The cone has five wide belt steps and geared into an internal gear on face-plate, giving 30 changes of speed. The carriage is provided with a tool-slide having compound-swivelling movement, also screw-cutting attachment and automatic cross and longitudinal feeds, which can be quickly changed at the carriage.

Code-Word . . . . . GLUTIO



72-INCH ENGINE LATHE

No. M-378

SWING over the bed, 73 inches. Over the carriage, 62 inches. Turns between centers with 20-foot bed, 8 feet 6 inches. The live spindle is a steel forging and has 30 changes of speed. The bed is triple sheared and is sufficiently wide to support the tool-slide without the latter overhanging the front side when turning the largest diameter. May be built with either one or two right and left-hand carriages.

Code-Word . GLUTISSE

HIGH-SPEED ENGINE LATHES

ON the following pages we illustrate a few of our recently designed High-Speed Engine Lathes of single pulley and quick-change gear type, the diameter of the driving pulley and width of belt being such as to provide power greatly in excess of that obtained by means of the cone pulley.

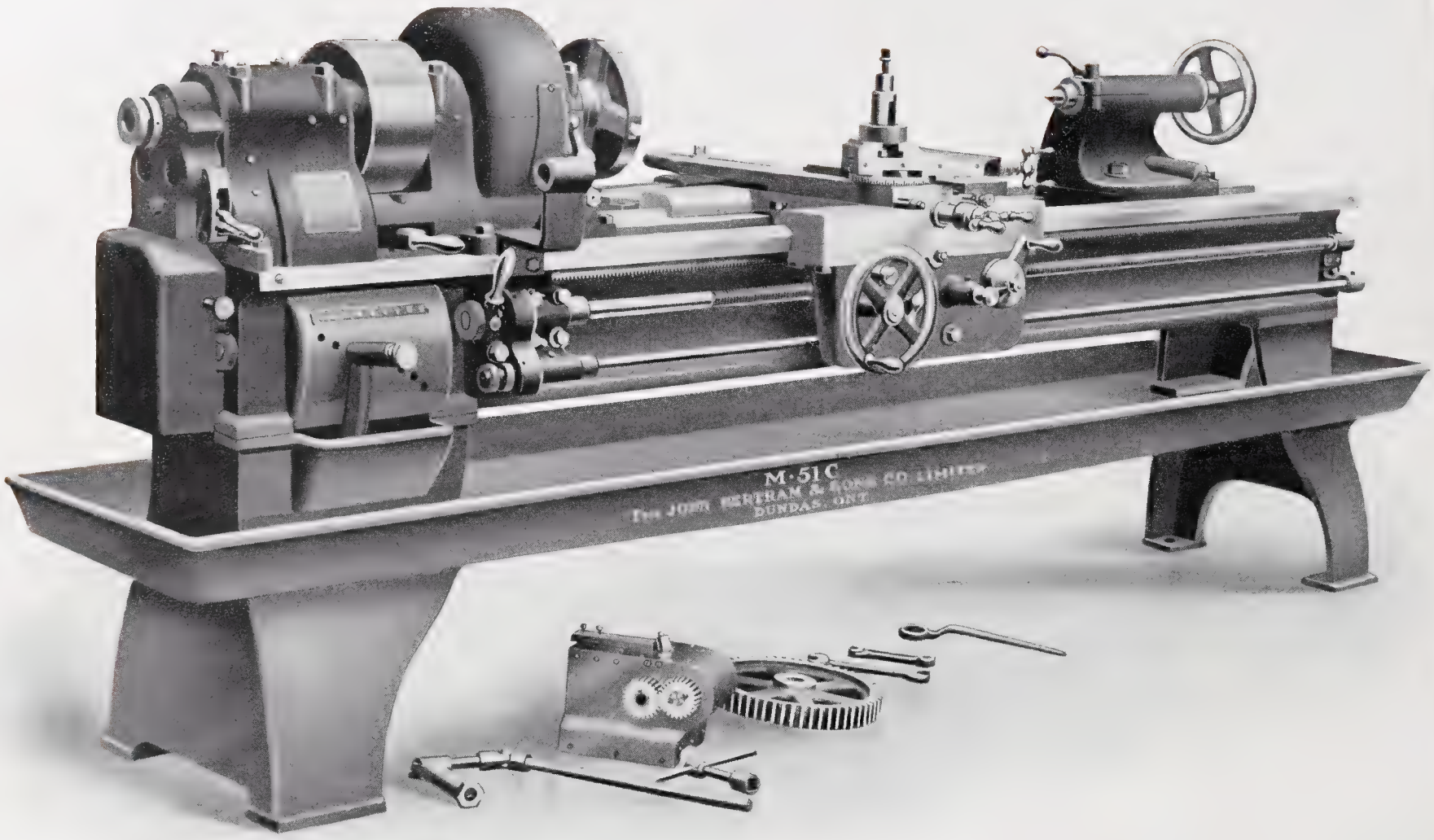
The gearing of the headstock is entirely enclosed, and special attention has been paid to the oiling of the bearings both of gearing and spindle. There are no gears running on shafts or studs, nor does the pulley revolve on the spindle, which is thus free from any strain that would otherwise be caused by the pull of the belt. Three mechanical changes of speed can be obtained by means of gearing in the headstock. Levers for adjusting the gears are conveniently placed in the front and can be operated with quickness and ease.

The design of the headstock is such that motor drive may readily be substituted without detracting in any way from the appearance or convenience of the machine. The use of a motor having a speed variation of 2 or 3 to 1, in conjunction with the mechanical speed changes obtained in the head tock, affords ample range of speeds for all requirements.

The carriages of these lathes are provided with power cross and longitudinal feeds. The lead-screw is used only for screw-cutting, turning-feeds being driven from an independent rod. A simple clutch arrangement throws either feed rod or screw, or both, out of gear as desired. The beds, saddles, aprons and tailstocks are of liberal dimensions and substantial design, in keeping with that of the headstocks where such a powerful drive has been provided.

DIMENSIONS

Size	SWING		Usual Length of Bed	Turns Between Centers	No. of Spindle Speeds	Countershaft-Pulleys		Code-Word
	Over Bed	Over Carriage				Dimensions	Revolutions	
Inches	Inches	Inches	Feet	Ft. & In.		Inches		
16	18¾	12¼	6	2	[illegible]	10 x 5	280 & 337	[illegible]
18	20½	[illegible]	[illegible]	3—9	9	10 x 6	270 & 324	GLUTMESSER
20	22½	14½	[illegible]	5—3	9	12 x 6	267 & 335	GLUTROTE
24	26	17	12	6	[illegible]	15 x 7½	250 & 300	[illegible]
[illegible]	32	[illegible]	14	6—4	9	18 x 9	240 & 288	GLUTTONS
[illegible]	34	22	14	6—4	9	[illegible]	235 & 280	[illegible]

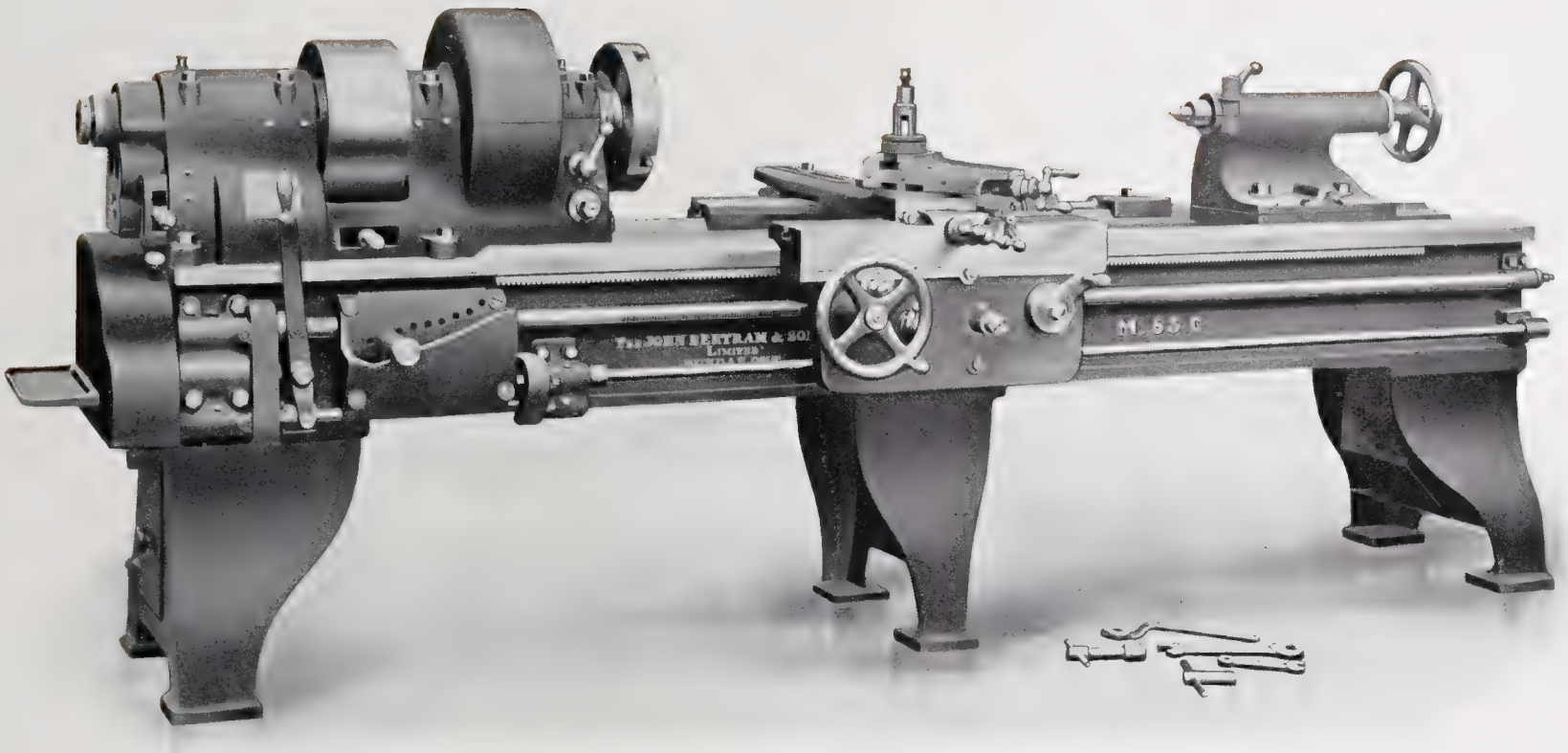


16-INCH HIGH-SPEED ENGINE LATHE

No. M-51 C

SWINGS over the bed 18½ inches. Over the carriage 12¼ inches. With 6-foot bed turns 2 feet between centers. This lathe is specially adapted for tool room use. It is equipped with independent screw-cutting and turning feeds and relieving attachment, as shown in the illustration. By the use of this attachment, taps, cutters, hubs, etc., may be backed off mechanically, thus eliminating one of the most expensive hand operations in the tool room. It has also quick change gear, taper attachment, with pan surrounding the bed.

Code-Word	Client
Code-Word, for relieving attachment	Gnocchi
Code-Word, for taper attachment	Gnathawk
Code-Word, for oil pan	Gnocco

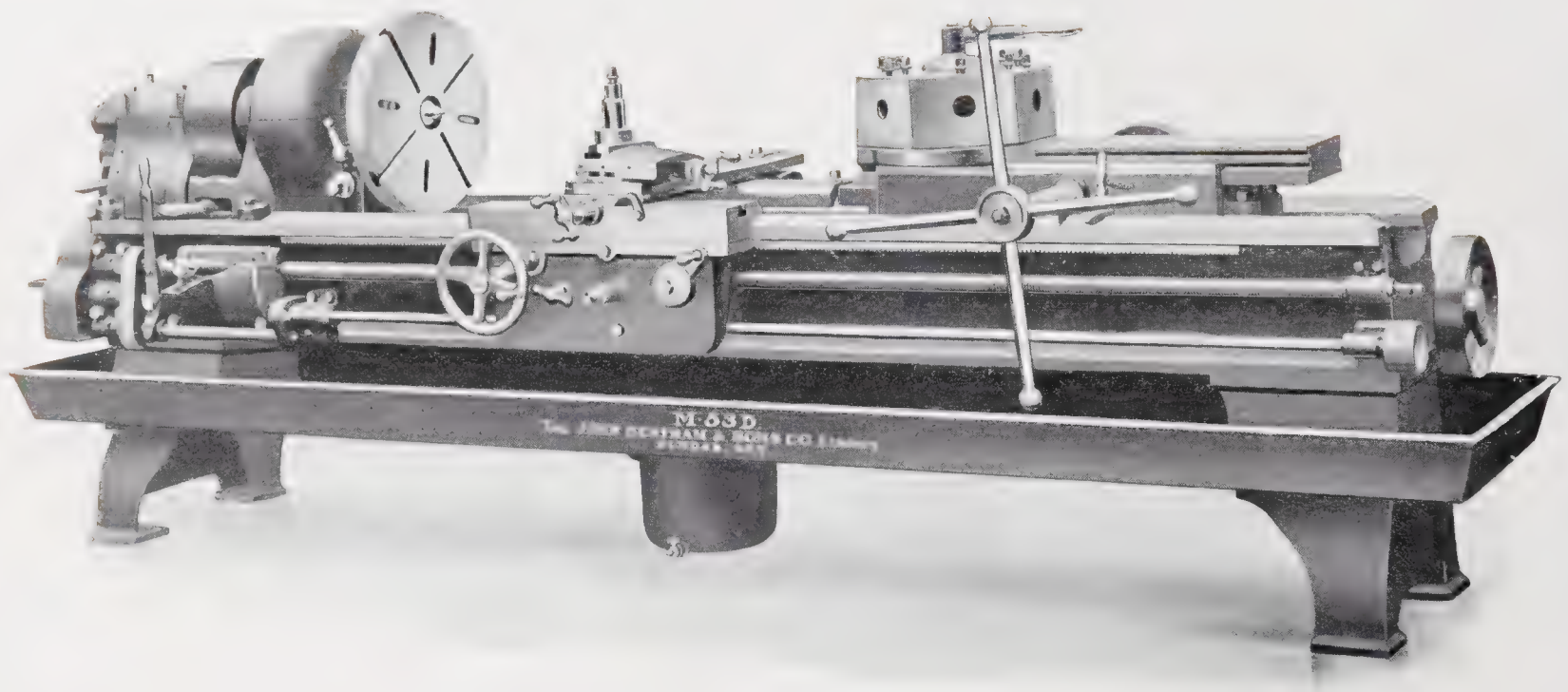


20-INCH HIGH-SPEED ENGINE LATHE

No. M-53 C

SWINGS 21½ inches over the bed. Over the carriage 14¼ inches. With 10-foot bed turns 5 feet 3 inches between centers. The lathe is double back geared, all gear being entirely enclosed. It has independent turning and screw-cutting feeds with quick-change gear.

Code-Word	GLUTROTE
Code-Word, for direct-connected motor	ICEBERG
Code-Word, for taper attachment	GNATHAWK

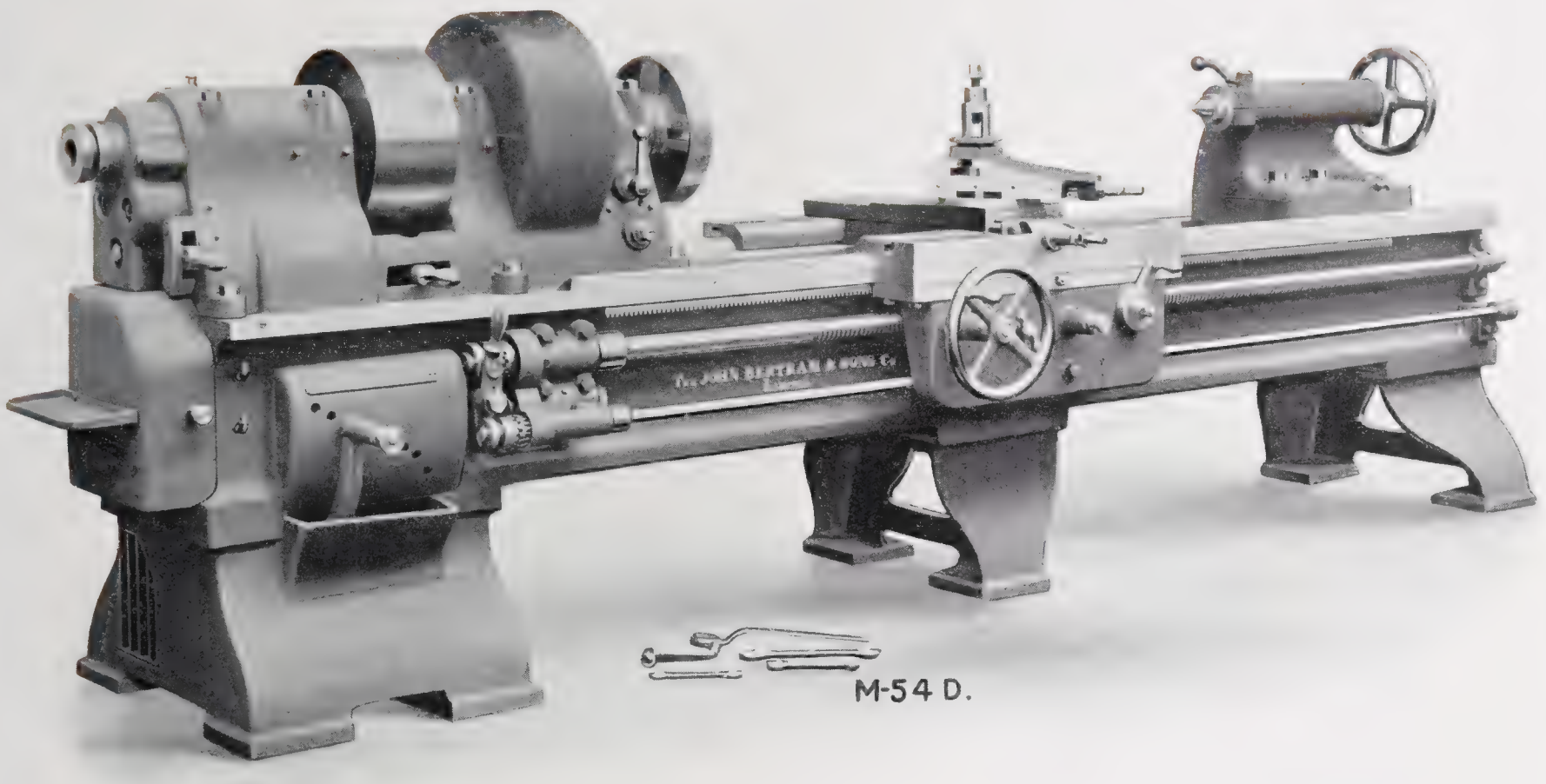


20-INCH HIGH-SPEED ENGINE TURRET LATHE

No. M-53 D

SWINGS 21½ inches over the bed. Over the carriage 14¼ inches. The standard length of bed is 10 feet. This lathe, equipped with turret on the shears having power feed, provides an economical manufacturing outfit for many purposes at a moderate cost. It is adapted to a wide range of work, such as boring and turning, tapping, threading, forming, etc. The turret may be adjusted on the shears and rigidly clamped, thus permitting it to be brought close to the work, or it can be taken off entirely and the machine used as a standard engine lathe when necessary.

Code-Word, for turret on shears	GNOMEN
Code-Word, for direct-connected motor	ICEBERG
Code-Word, for oil pan	GNOCCO
Code-Word, for turret with power feed	GRADUATION
Code-Word, for taper attachment	GNATHAWK

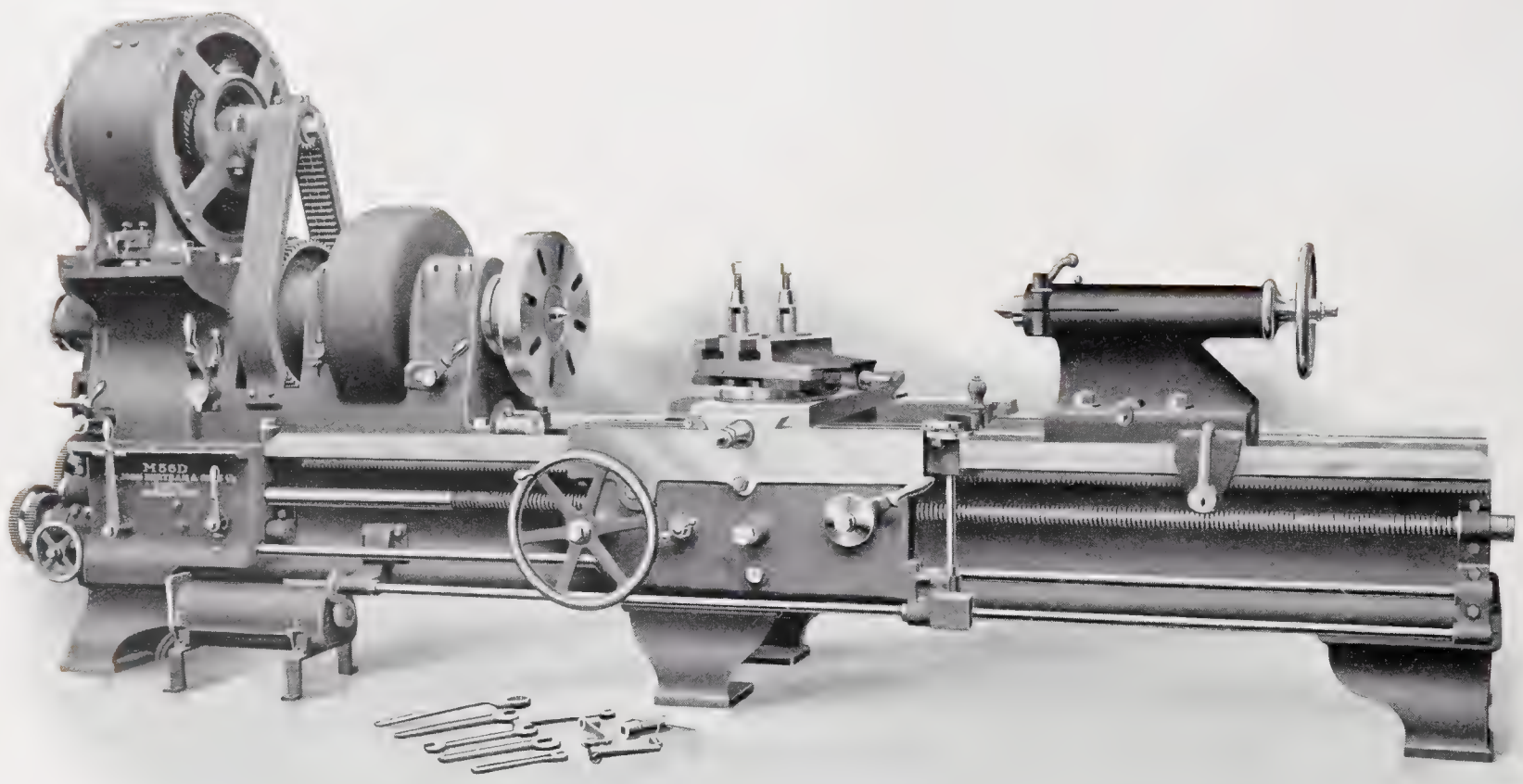


24-INCH HIGH-SPEED ENGINE LATHE

No. M-54 D

SWINGS 26 inches over the bed. Over carriage 17 inches. With 12-foot bed turns 6 feet between centers. The gearing in the headstock is entirely enclosed. The power is transmitted from a 7-inch belt, giving 9 forward speed with reverse and 18 speeds without reverse.

Code-Word . . . . . GLUTTITE
Code-Word, for direct-connected motor . . . . . ICEBERG



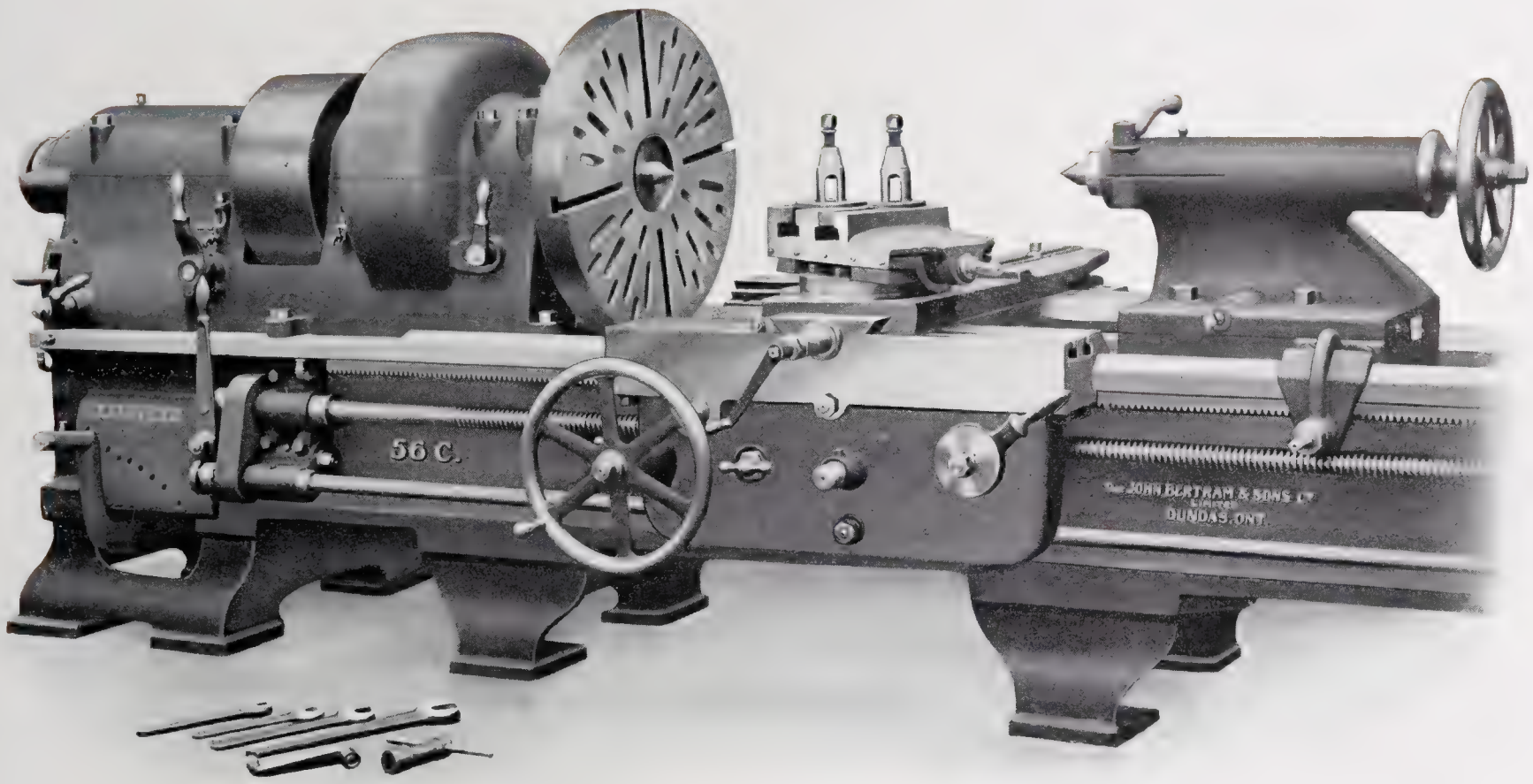
30-INCH HIGH-SPEED ENGINE LATHE

MOTOR DRIVEN

No. M-56 D

SWING over the bed 32 inches. Over carriage 20 inches. With 14-foot bed turns 6 feet 4 inches between centers. This lathe is specially designed for rough turning forgings. The motor is attached to a projection on the rear cap, the drive for the first gear sleeve being by means of silent chain. A motor having a speed variation of 3 to 1, gives, in conjunction with the three mechanical speed changes obtained in the headstock, ample range of speeds for all requirements. When a variable speed motor is used, the controller is operated by means of a handle of easy access at the right hand of saddle.

Code-Word . . . . . GLUTTONS
Code-Word, for direct-connected motor . . . . . ICEBERG



32-INCH HIGH-SPEED ENGINE LATHE

No. M-56 C

SWINGS 34 inches over the shears. Over carriage 22 inches. With 14-foot bed turns 6 feet 4 inches between centers. This lathe is specially strong and rigid. The head is fitted with double gear completely enclosed and operated by levers from front of headstock, instantly changing the speed of spindle from fast to slow back gear. It has 9 inch belt capacity and is capable of carrying the heaviest cuts made possible by modern high-speed tool steel.

Code-Word	GLUURDER
Code-Word, for direct-connectd motor	ICEBERG
Code-Word, with quick change gear	GNOFF

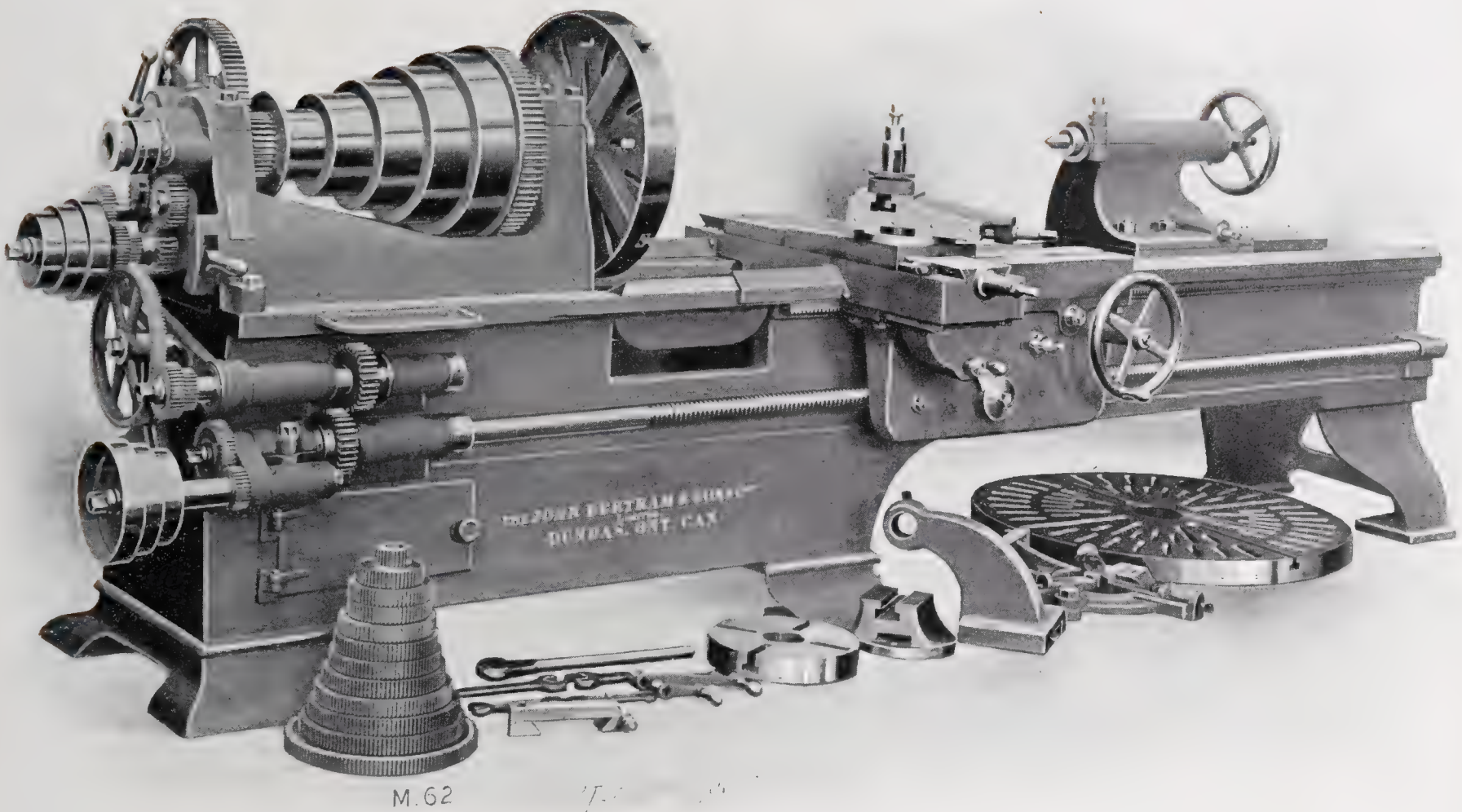
GAP LATHES

FROM 36 TO 60-INCH SWING

THE line of Gap Lathes illustrated on the following pages are standard machines for general shop use. These machines meet the demand for lathes capable of boring and facing work of large diameter and at the same time doing all work within their capacity accurately and well. The loose-piece forming the ways of the bed is accurately fitted in the gap opening and held in place by bolts and tapered pins, and with these pieces in place, the lathes are in no respect less desirable for ordinary work than the standard lathes. The carriages are fitted with compound swivelling tool-slides and have screw-cutting attachment, longitudinal and crossfeeds, and are arranged to turn the full swing in the gap. Each lathe is provided with steady rsst, a full set of screw-cutting gear, face-plates, countershaft and wrenches.

DIMENSIONS

Size of Machine	SWING			Usual Length of Bed	Turns Between Centers	Usual No. of Spindle Speeds	Countershaft-Pulleys		Code-Word
	Over the Bed	Over the Carriage	In Gap				Dimensions	Revolutions	
Inches	Inches	Inches	Inches	Feet	Ft. & In.		Inches		
36	21¾	13⅞	37	10	5—4	10	14 x 4	100	GOADED
40	26	17	41	12	6—9	10	16 x 4	90	GOADLOUP
50	32	20	51	14	7	15	22 x 5	80	GOAFFLAP
60	39	28	62	14	6	15	24 x 4½	80	GOALPOST

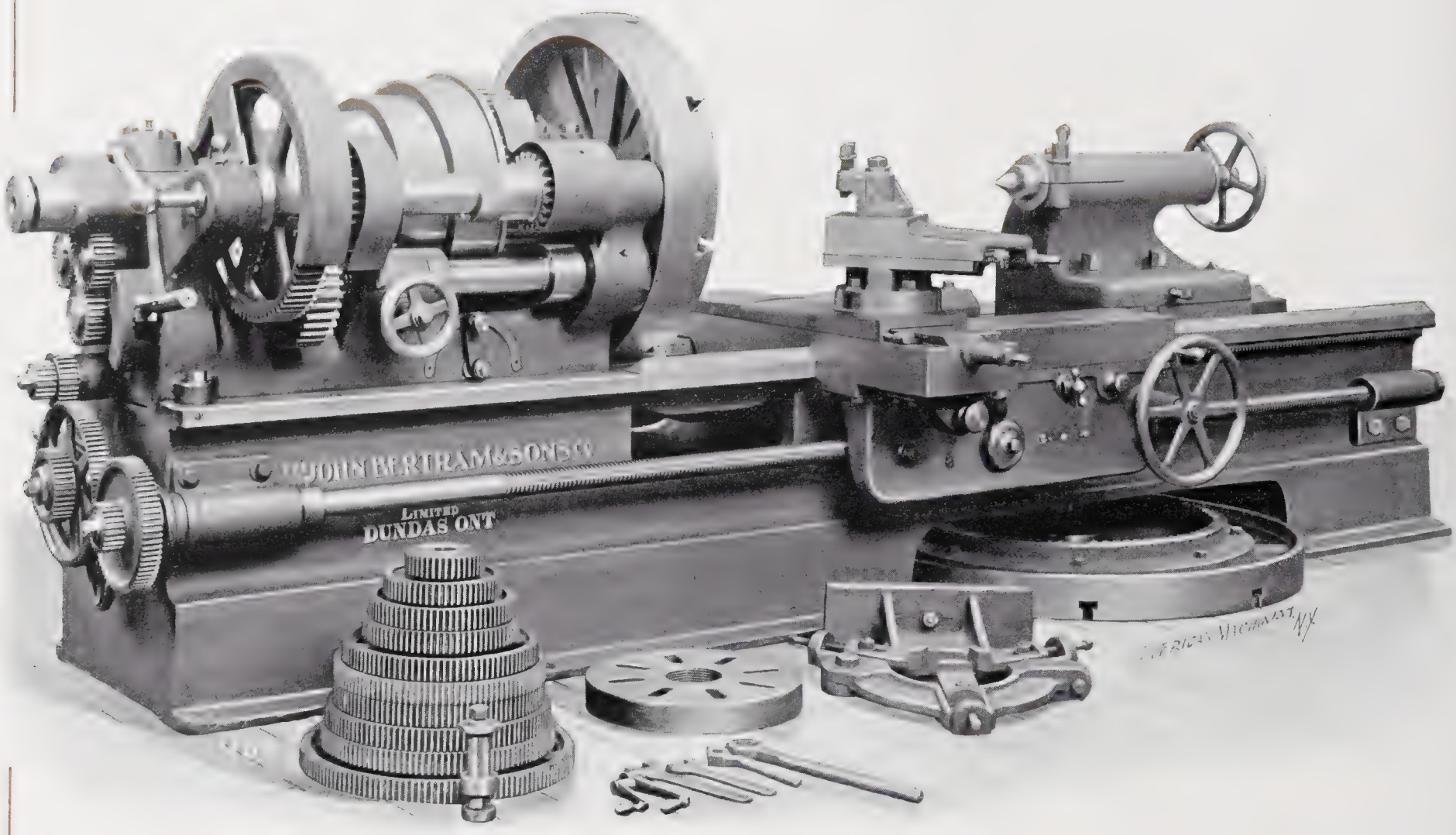


24-INCH x 40-INCH GAP LATHE

No. M-62

SWING over the bed 26 inches. Over the carriage 17 inches. In gap 41 inches. Turns between centers with 12-foot bed, 6 feet 9 inches. The saddle is arranged to turn the full swing in gap and is provided with power longitudinal and crossfeeds.

Code-Word . . . . . GOADLOUP



36-INCH x 60-INCH GAP LATHE

No. M-64

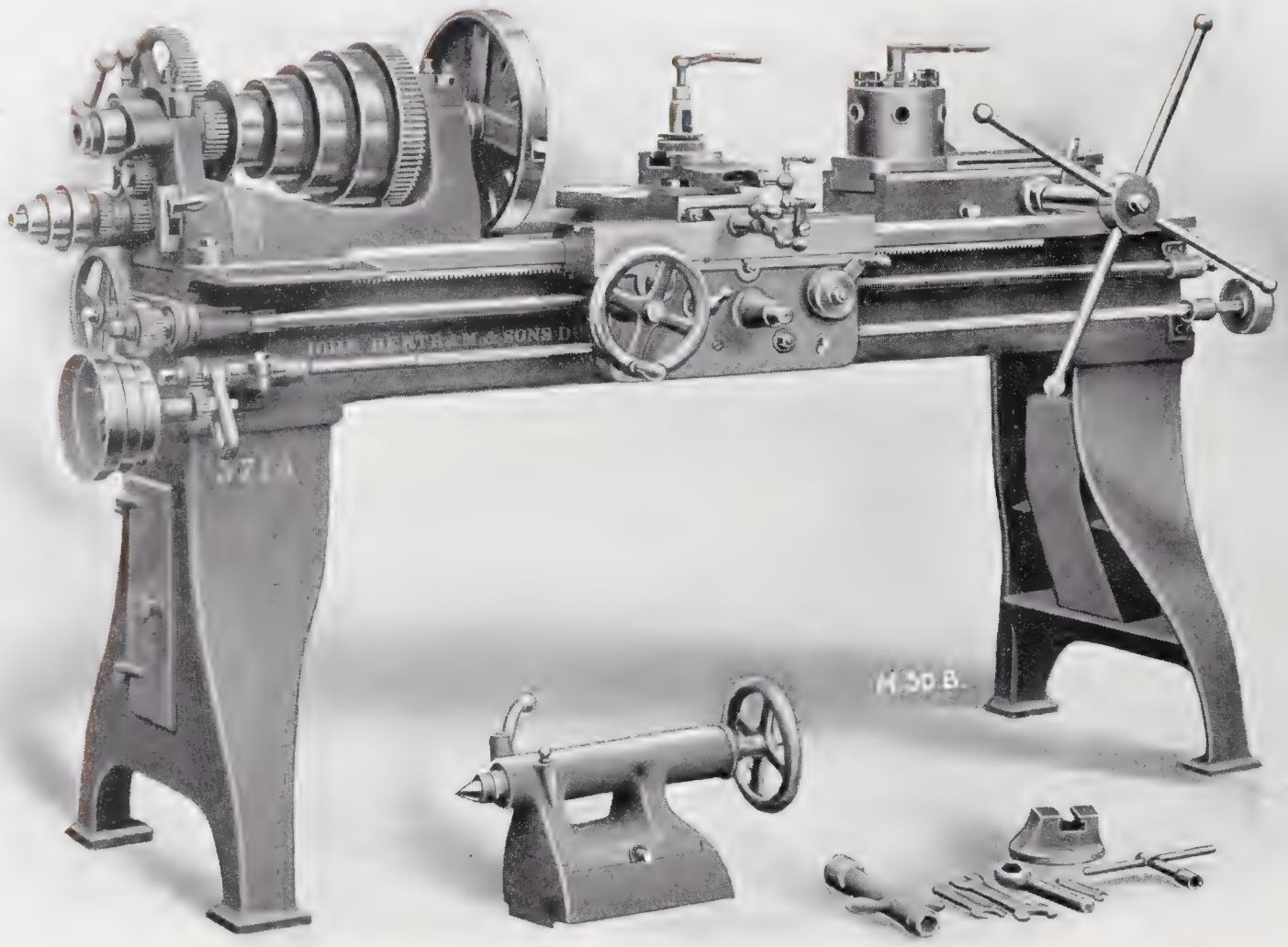
SWING over the bed 39 inches. Over the carriage 28 inches. In gap 62 inches. Turns between centers with 14-foot bed, 6 feet. The spindle is triple geared and has 15 changes of speed.

Code-Word . . . . . GOALPOST

ENGINE LATHES WITH TURRETS

ON the following pages we illustrate a special line of engine turret lathes. The demand for rapid lathe work, together with the increased knowledge regarding the value of turret lathes, has led to the adoption of the turret on the carriage in place of the regular compound rest, or a turret on the shears in place of, or to interchange with the standard tailstock. Although these turrets are of massive proportion and possess rigidity to an unusual degree, they are very conveniently handled—an important factor towards the end sought.

The carriages are very heavy and gibbed to the outside of beds both front and rear. The regular engine lathe apron is applied, which gives friction longitudinal feeds and power crossfeed sufficient to face the full swing of the lathe; a split nut engages the leadscrew for screw-cutting purposes. The heads are strongly back geared, and a wide cone section gives ample power for carrying heavy cuts. Being of friction type, they can be instantly changed from belt speed to back gear without stopping. Taper attachment and any length of bed can be supplied when so ordered.

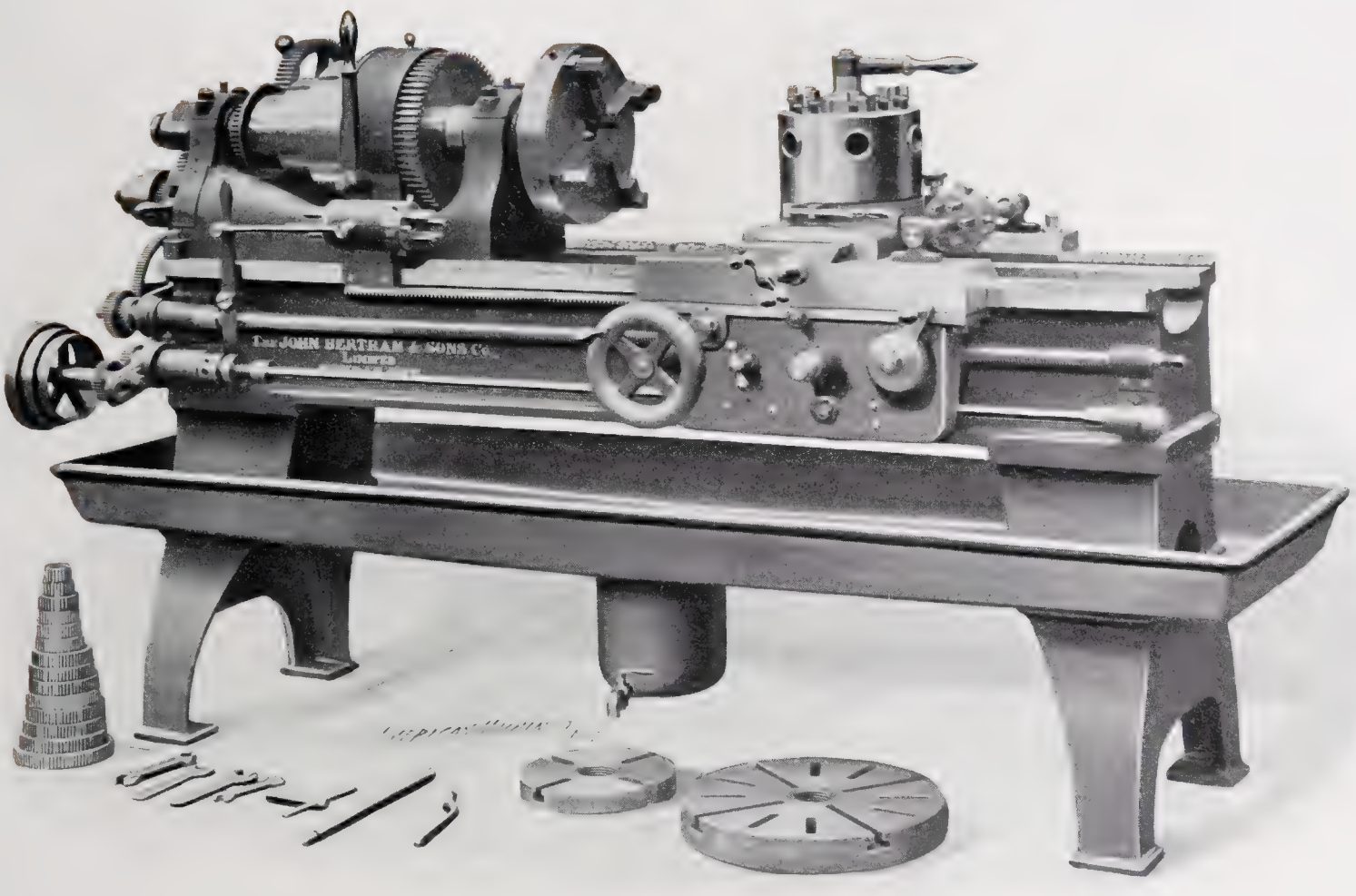


12-INCH ENGINE LATHE WITH TURRET ON BED

No. M-50 B

THE demand for rapid lathe work together with the increased knowledge regarding the value of turret lathes has led to the adoption of the turret on the regular engine lathe in place of the tailstock. If desired the tailstock is also furnished, so that a complete engine lathe is at hand by removing the turret. The lathe swings over the bed 14 inches, over the carriage 8½ inches. The standard length of bed is 5 feet. The turret is furnished with power feed and revolves automatically or by hand to suit the user.

Code-Word . . . . . GLUMPY
Code-Word, for turret on shears . . . . . GNOMEN

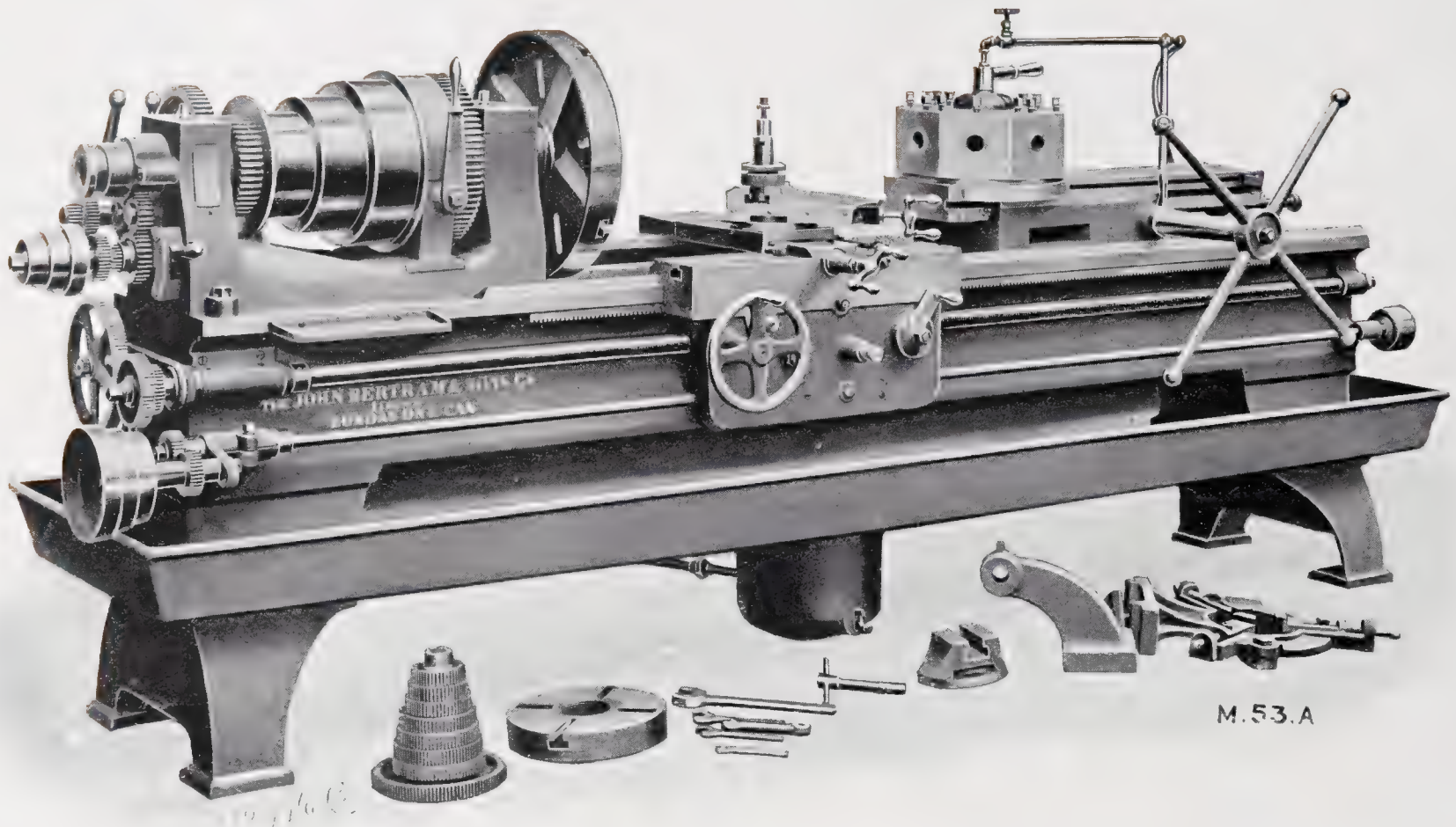


16-INCH COMBINATION TURRET LATHE

No. M-51 B

SWING over the bed 18½ inches. Over the carriage 10 inches. The bed is 6 feet long. The headstock is back geared and has a three-section cone for 3¼-inch belt, the largest section being 10 inches in diameter, and is fitted with friction clutch for instantly changing from belt speed to back gear without stopping. The carriage is provided with independent rod and screw feeds. The turret is supported on a broad base and has power crossfeed. Adjustable stops are provided for both cross and longitudinal movement, the latter having automatic trip. The turret is 9 inches in diameter and has six holes lined with hardened steel ferrules. The lathe is furnished with oil pan which entirely surrounds the machine, change gear and countershaft.

Code-Word . . . . . GOLDPROOF



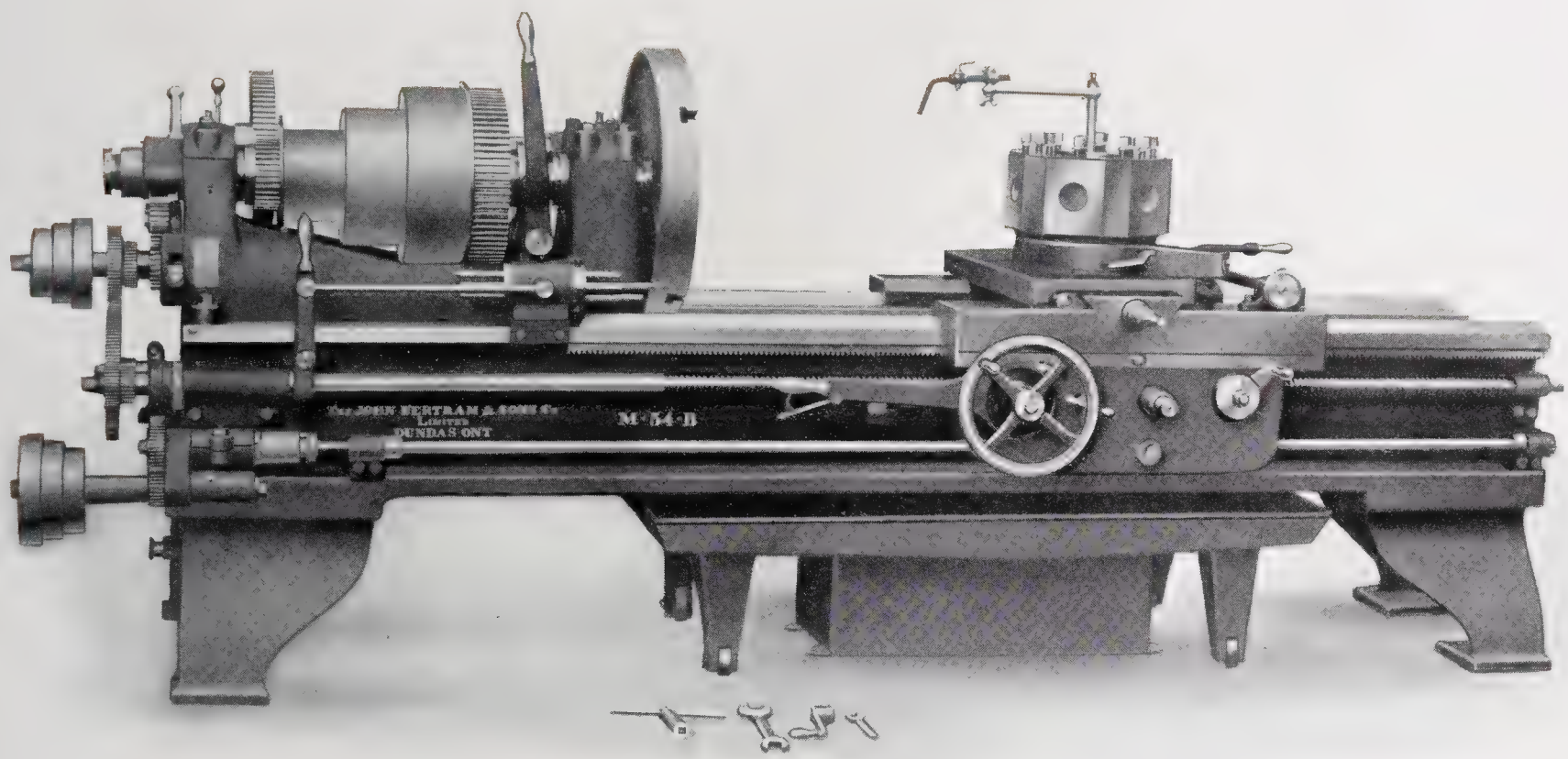
20-INCH ENGINE LATHE

WITH TURRET ON BED

No. M-53 A

THE lathe illustrated represents our 20-inch engine lathe fitted with friction head, and turret on the shears in place of, or to interchange with the standards tailstock. The headstock is back geared and has a three-section cone for 3½-inch belt, the largest section being 13 inches in diameter, and is fitted with friction clutch for instantly changing the belt speed to back gear without stopping. The turret is hexagon in form, mounted on a long slide; has six holes lined with hardened ferrules, and is made with or without automatic movement and power feed as desired. The saddle has power cross and longitudinal feeds, having compound and plain tool rests. The lathe is furnished with oil pan which entirely surrounds the machine, a complete set of change gear, large and small face-plate, oil pump and attachments, steady rest, countershaft and wrenches.

Code-Word . . . . . GLUTIAM
Code-Word, turret on shears . . . . . GNOMEN

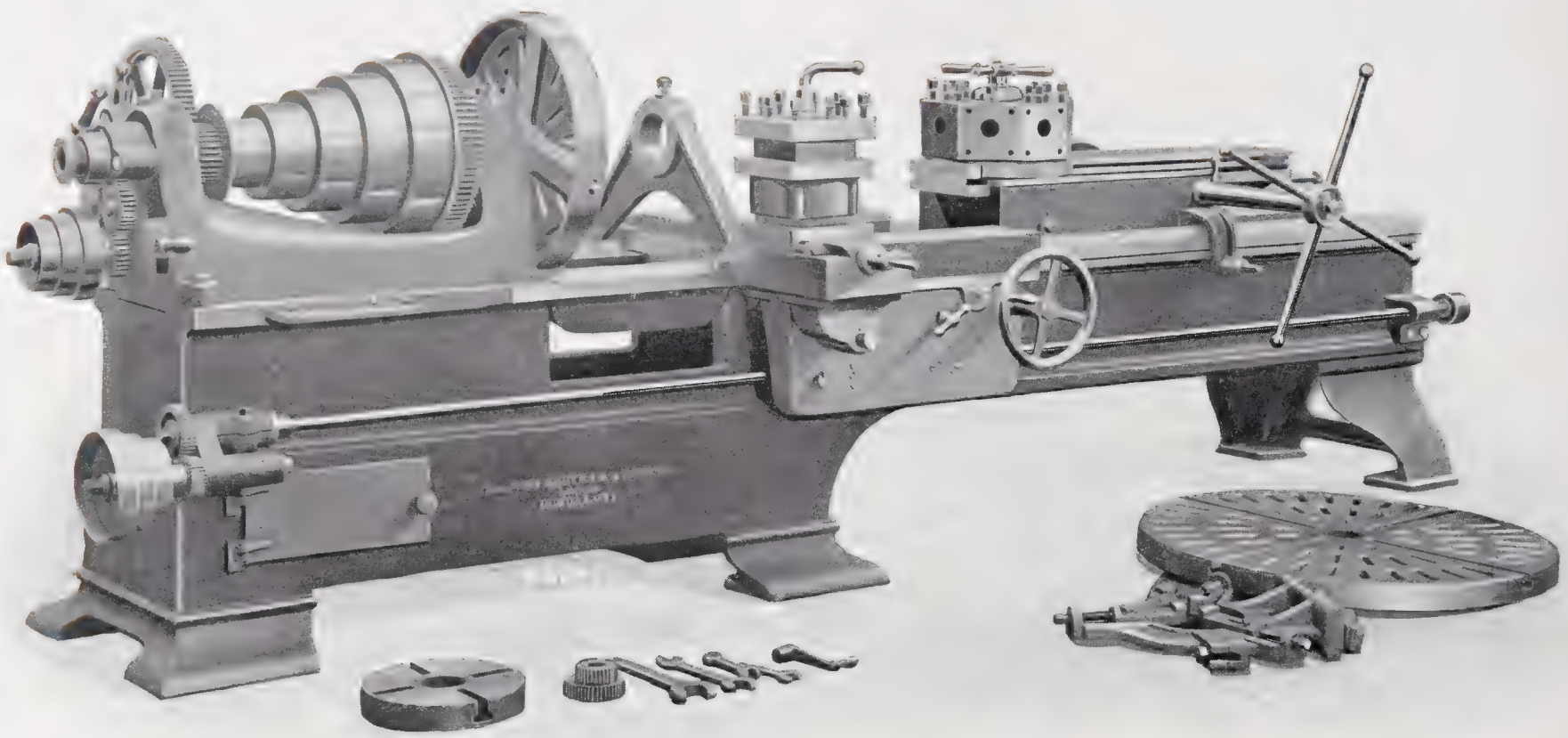


24-INCH COMBINATION TURRET CHUCKING LATHE

No. M-54 B

SWING over the bed 25 inches. Over the carriage 16½ inches. The bed is 10 feet long. The head is back geared and has a three-section cone for 4½-inch belt, largest section being 16 inches in diameter. It is fitted with a clutch for instantly changing from belt speed to back gear without stopping. The carriage is gibbed both front and rear and is provided with independent rod and screw feeds. The turret is supported on a broad base on the carriage and has power crossfeed. Adjustable stops are provided for both cross and longitudinal movements, the latter having automatic trip. The machine is furnished with drip pan, oil pump and attachments, complete set of change gear, countershaft and wrenches.

Code-Word . . . . . GOLDREAR

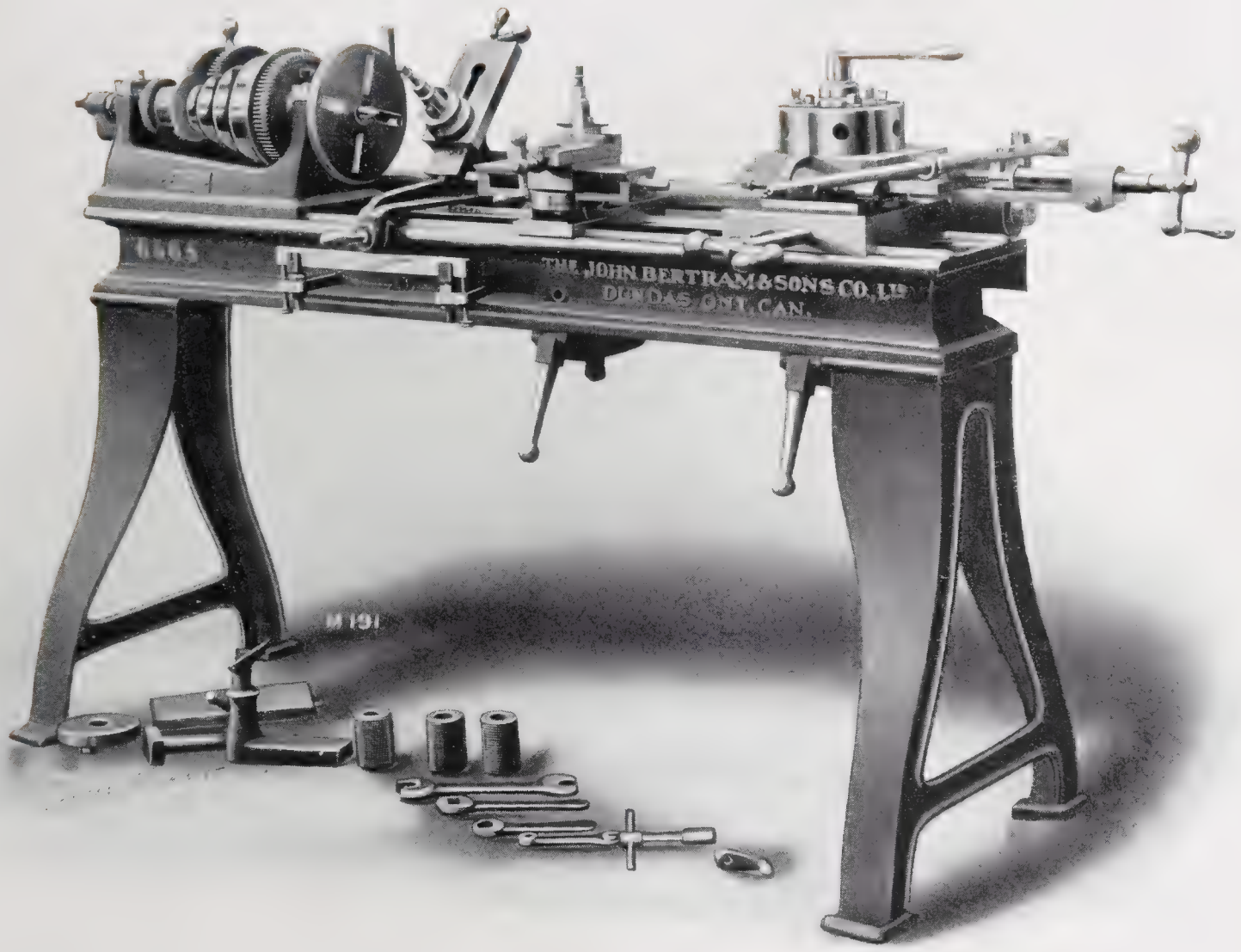


24-INCH x 40-INCH GAP TURRET CHUCKING LATHE

No. M-62 C

THIS lathe is designed for chucking and boring work up to 40 inches in diameter. Swings 41 inches in the gap, 26 inches over the ways, and 17 inches over the saddle. The carriage has power cross and longitudinal feeds and is provided with a capstan rest for four tools. By revolving the rest any tool may be quickly brought to the work and securely fastened by a binder. The turret is hexagon in form, revolving automatically, and has six holes which are lined with hardened ferrules. The turret-slide is provided with hand and power feed, has 16-inch traverse and an adjustable automatic stop. A steady rest is furnished to guide the boring bar. The countershaft has double friction pulleys 16 inches in diameter for 4-inch belt, and should make 90 revolutions per minute.

Code-Word . . . . . GOADLOUP
Code-Word, for turret on shears . . . . . GNOMEN

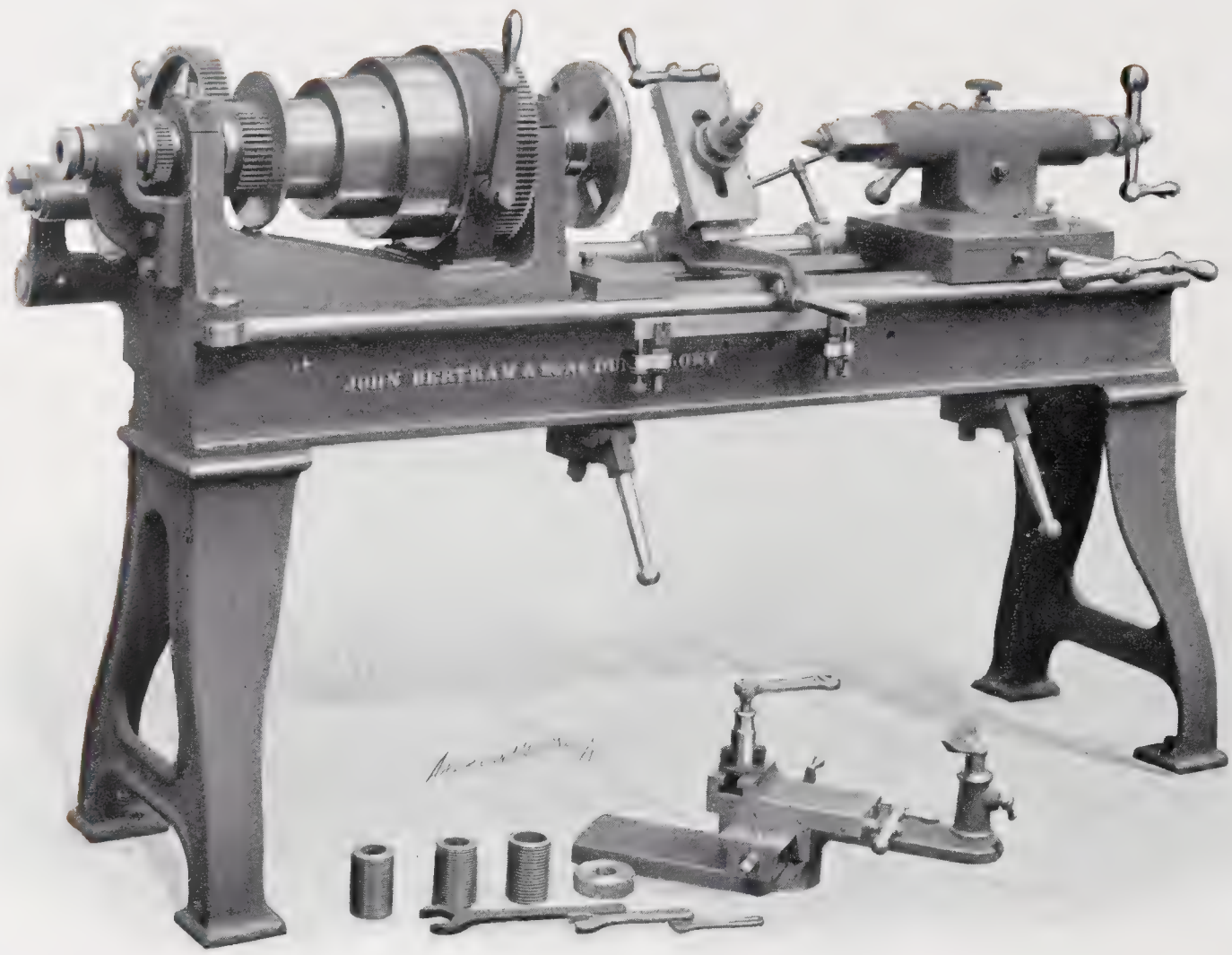


14-INCH x 6-FOOT UNIVERSAL MONITOR LATHE

No. M-191

THE illustration represents our Universal Monitor Lathe. Swing 14 inches. Standard bed is 6 feet long. The headstock has a four-step cone and is back geared. The turret-slide is provided with swivel and set-over, adapting the machine to a wide range of work. The swivel can be set to bore any desired taper while the set-over faces square with the center of the work. The turret-slide can be operated by either lever or screw. The chaser-bar has substantial bearings and is so arranged that straight or taper threads can be cut. Each machine is furnished with four hobs, compound and hand rests, face-plate, countershaft and wrenches.

Code-Word . . . . . GOLDSAND
Code-Word, with square arbor tailstock . . . . . GOLDSHELL

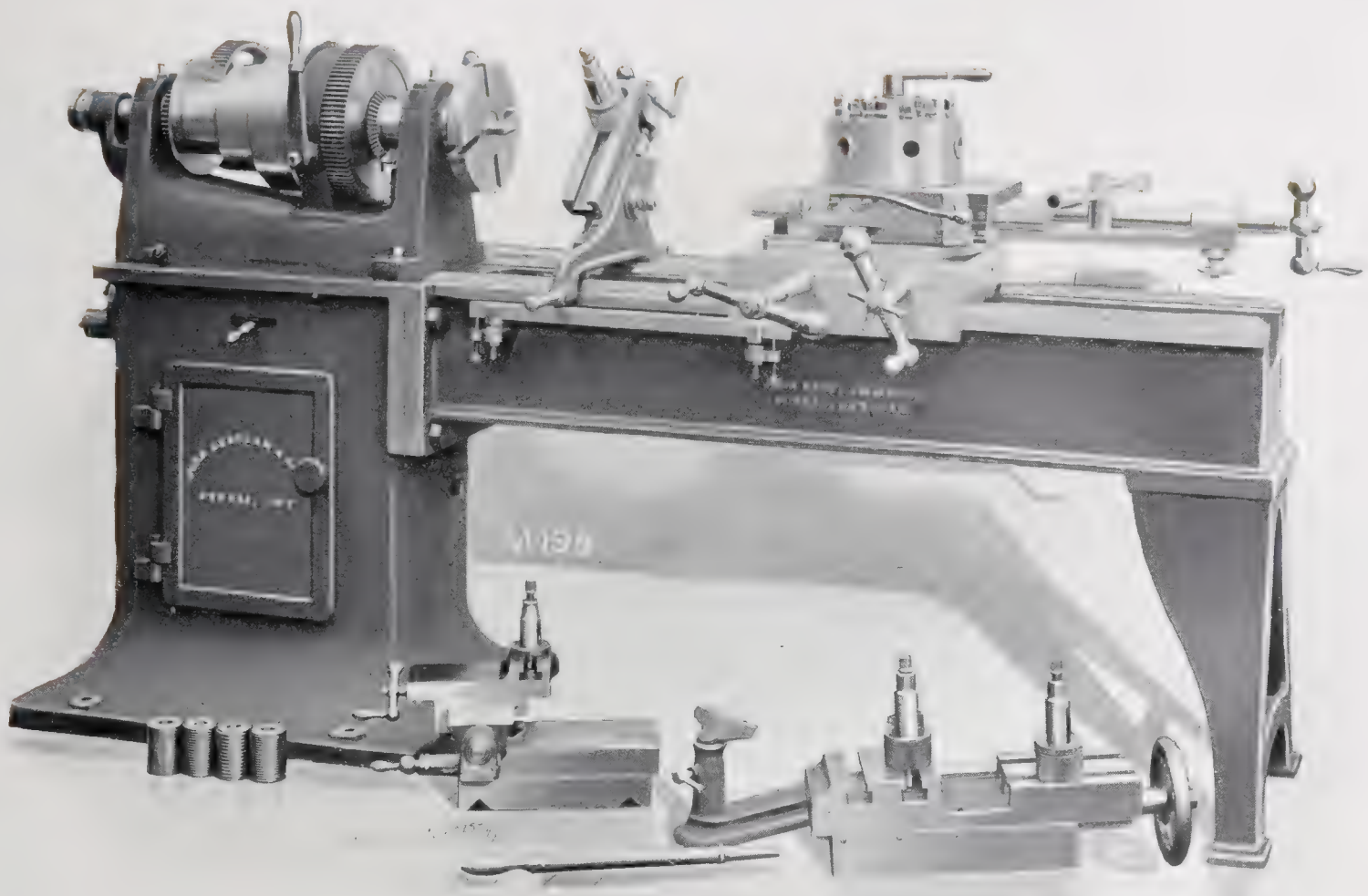


18-INCH SQUARE ARBOR LATHE

No. M-192

THE head is back geared and has a three-section cone for 3¼-inch belt, the largest section being 11 inches in diameter, and is fitted with friction clutch for instantly changing from belt speed to back gear without stopping. The square arbor bearing is constructed in such a manner that when any looseness occurs from being in constant use it can be taken up in a thorough, substantial manner. The tailstock has both set-over and swivel movement. Chaser-bar attachment, with four hobs, compound and hand rests, countershaft and wrenches are supplied with the lathe.

Code-Word . . . . . GOLDSTICK



20-INCH UNIVERSAL MONITOR LATHE

No. M-198

THIS lathe is designed to cover a wide range of brass work. The head is back-geared and has a three-section cone for 3½-inch belt, largest section being 11 inches in diameter It is fitted with friction-clutch for instantly changing from belt-speed to back-gear without stopping. The turret-slide can be operated by either lever or screw, has a set-over movement for facing, and the turret can always be brought to the center with the spindle by a positive stop. The chasing-bar is rigid, being carried on substantial bearings, and is so arranged that either straight or tapered threads may be cut. The regular equipment supplied with this lathe is compound-rest, plain hand-rest, cutting-off rest, one leader, four hobs, countershaft and wrenches.

ENGINE LATHES WITH EXTENSION BEDS

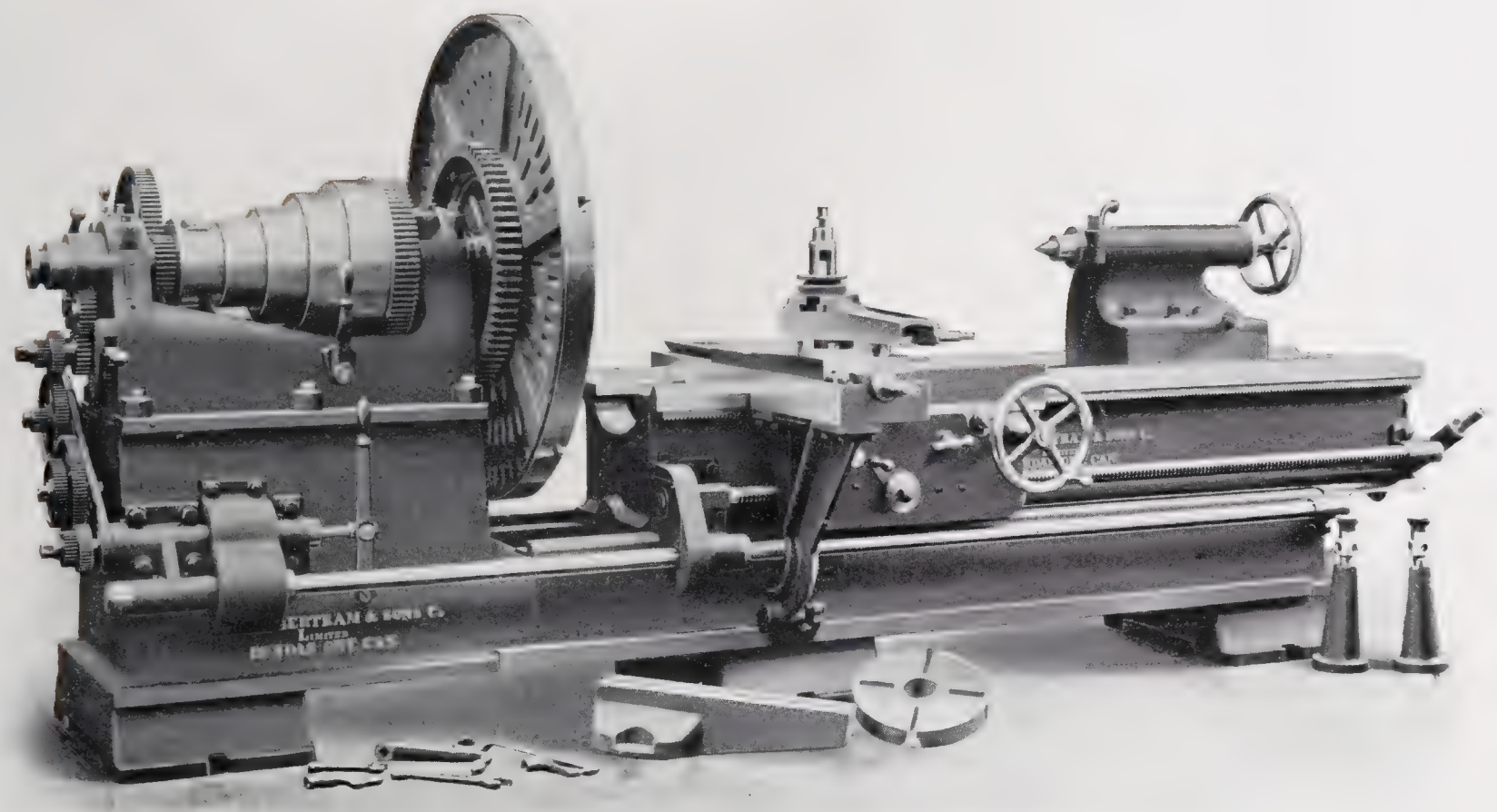
WE illustrate on the following pages a line of improved engine lathes with extension beds. These lathes are very convenient tools for mill repair shops and machine shops doing general machine work.

The lathes are built with all the attachments and improvements of the standard engine lathe with increased power in driving-gear to enable work to be turned full swing over the lower bed.

The carriage will traverse the full length of the upper bed, and is fitted with compound swivelling-rest, having power cross and longitudinal feeds. The extension-bed has a broad base carefully fitted to the lower bed and moved lengthwise by rack and pinion, and can be made any desired length. Attached to the lower bed is a floor-plate having planed "T" slots, to which is fitted a pedestal carrying compound slide-rest operated by ratchet.

DIMENSIONS

No.	Swing Over Upper Bed	Swing Over Carriage	Swing Over Lower Bed	Standard Length of Bed	Distance Between Centers When Closed	Distance Between Centers When Extended	Countershaft-Pulleys		Code-Word
							Dimensions	Revolutions	
	Inches	Inches	Inches	Feet	Ft. & In.	Ft. & In.	Inches		
28	28	20	48	8	6		15	160 & 200	GLYCILE
36	[illegible]	26½	72	10	[illegible]	11—2	24	105 & 132	GLYCOGEN
60	68	50½	100	12	[illegible]8	12—8	24	140 & 160	GLYCONIC

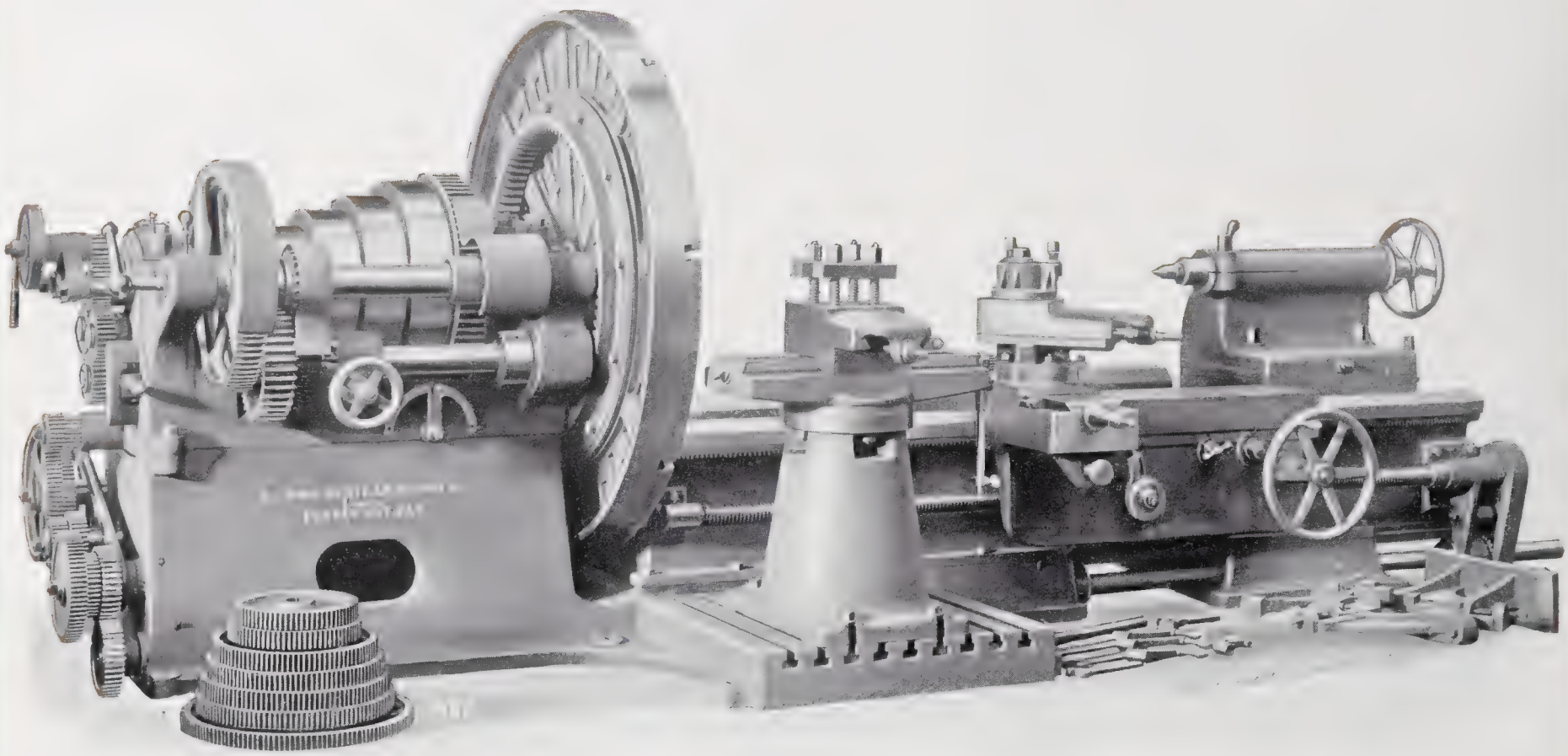


28 x 48-INCH EXTENSION-BED ENGINE LATHE

No. M-355

SWING over the upper bed, 28 inches. Over the lower bed, 38 inches. Over the carriage, 20 inches. With sliding-bed 8 feet long turns between centers 6 feet when closed, and 11 feet when extended. The carriage has power cross and longitudinal feeds, also side-rest with extension-arm for turning the full swing over the lower bed. The extension-bed has a broad bearing carefully fitted to the lower bed, is moved lengthwise by screw and crank at tailstock end and may be made any desired length. The lathe is equipped with steady-rest, change-gear for screw-cutting, countershaft and wrenches.

Code-Word . . . . . GLYCILE

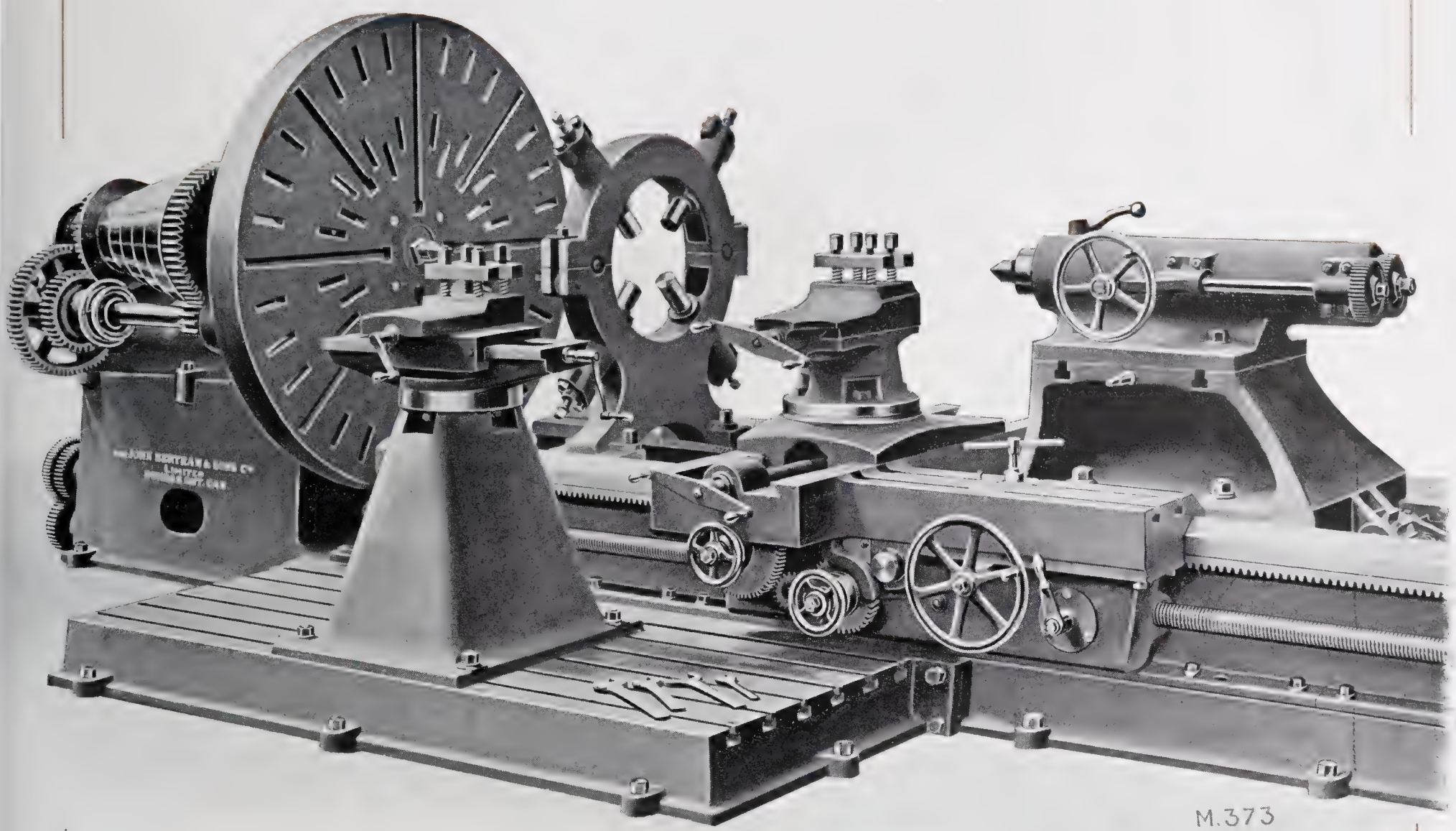


36 x 72-INCH EXTENSION-BED ENGINE LATHE

No. M-65

SWING over the upper bed, 38 inches. Over the carriage 20½ inches. With sliding-bed 10 feet long turns between centers 7 feet 2 inches when closed, and 11 feet 2 inches when extended. Will turn over the lower bed 72 inches and admit 48 inches in width. The carriage has power longitudinal and cross feeds. The feed mechanism of apron is operated by feed rod carried inside of lower bed. A full set of screw-cutting gear is provided, also steady-head, countershaft and wrenches.

Code-Word . . . . . GLYCOGEN



M.373

60 x 100-INCH EXTENSION-BED ENGINE LATHE

No. M-373

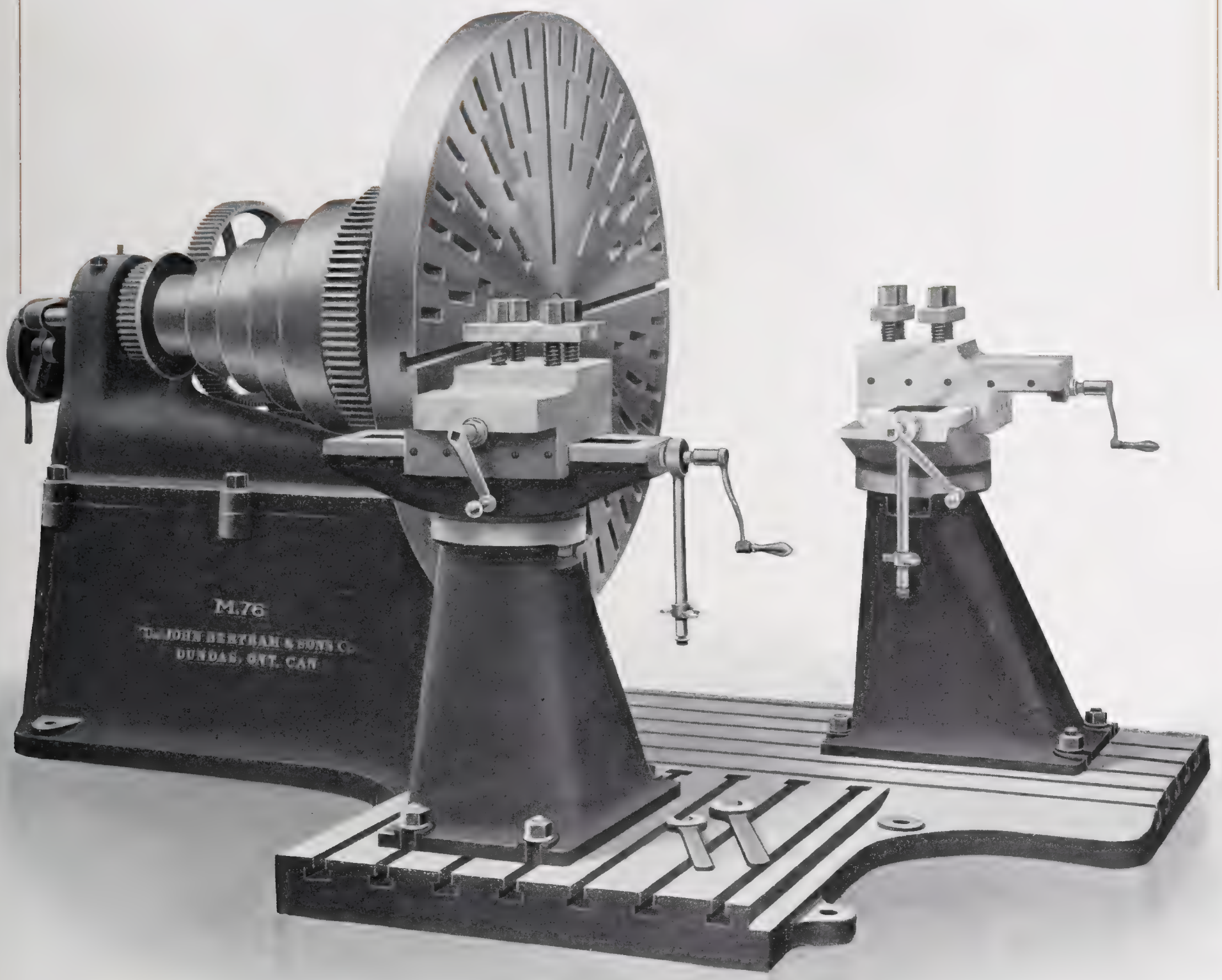
SWING over the upper bed, 68 inches. Over the carriage, 50½ inches. With sliding-bed 12 feet long turns between centers 7 feet 8 inches when closed, and 12 feet 8 inches when extended. Will turn over the lower bed 100 inches and admit 60 inches in width. The carriage has longitudinal feed by screw. The feed mechanism of apron is operated by feed rod carried inside of lower bed. The cone has five wide steps of large diameter. It is mounted on the face-plate pinion spindle, is back-geared and geared into an internal gear on the face-plate, giving twenty changes of speed. The tailstock is held by four bolts and a pawl engaging in rack in the center of bed. The lathe is equipped with a full set of screw-cutting gear, steady-head, countershaft and wrenches.

Code-Word . . . . . GLYCONIC

SURFACING AND BORING LATHES

ON the following pages we illustrate a few of our recently designed Surfacing and Boring Lathes. The bed is of deep box form, cast in one piece and braced by cross ribs, on which is mounted a strong, well proportioned triple-geared head with steel spindle running in bronze-lined bearings. The pedestals are fitted in planed "T" slots on the foundation-plate, and carry compound slide-rests, self-acting for surfacing or boring, operated by ratchet motion. All large size lathes are also fitted with tailstock and compound slide-rest on a movable column carried on an extension of the foundation-plate. We manufacture these lathes in the following sizes: swing 72, 84, 96, 108 and 120 inches over the foundation-plate.

	With Two Pedestals	With Tailstock
Code-Word, 72-inch Face Lathe	GNOTO	GNOUAC
Code-Word, 84-inch Face Lathe	GNUAUGE	GNUBLICK
Code-Word, 96-inch Face Lathe	GNUDARSI	GNUDO
Code-Word, 108-inch Face Lathe	GNUHUF	GNULAUF
Code-Word, 120-inch Face Lathe	GNURREN	GNURRSI

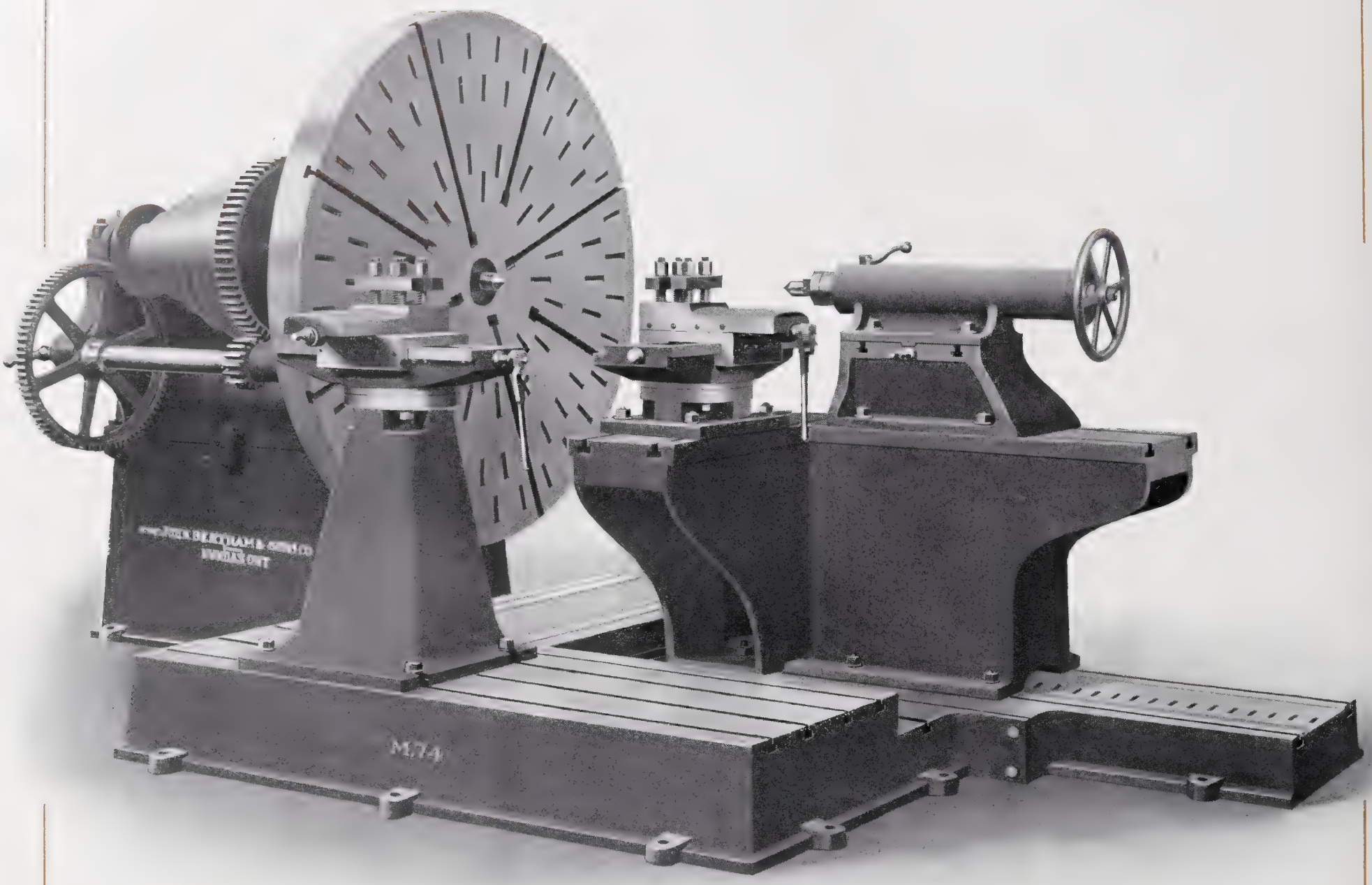


84-INCH FACE LATHE

No. M 76

SWING over the bed, 85 inches. This lathe has a strong, well proportioned triple-geared head with steel spindle running in bronze-lined bearings, with provision for taking up wear. The face-plate is fitted to the flange of the live spindle and is held by four bolts. Two compound slide-rests, self-acting for boring or surfacing, operated by ratchet motion, mounted on substantial pedestals, are supplied. The countershaft pulleys are 24 inches in diameter for 6-inch belt, and should make 90 revolutions per minute.

Code-Word, with two pedestals . . . . . GNUAYGE
Code-Word, with tailstock . . . . . GNUBLICK

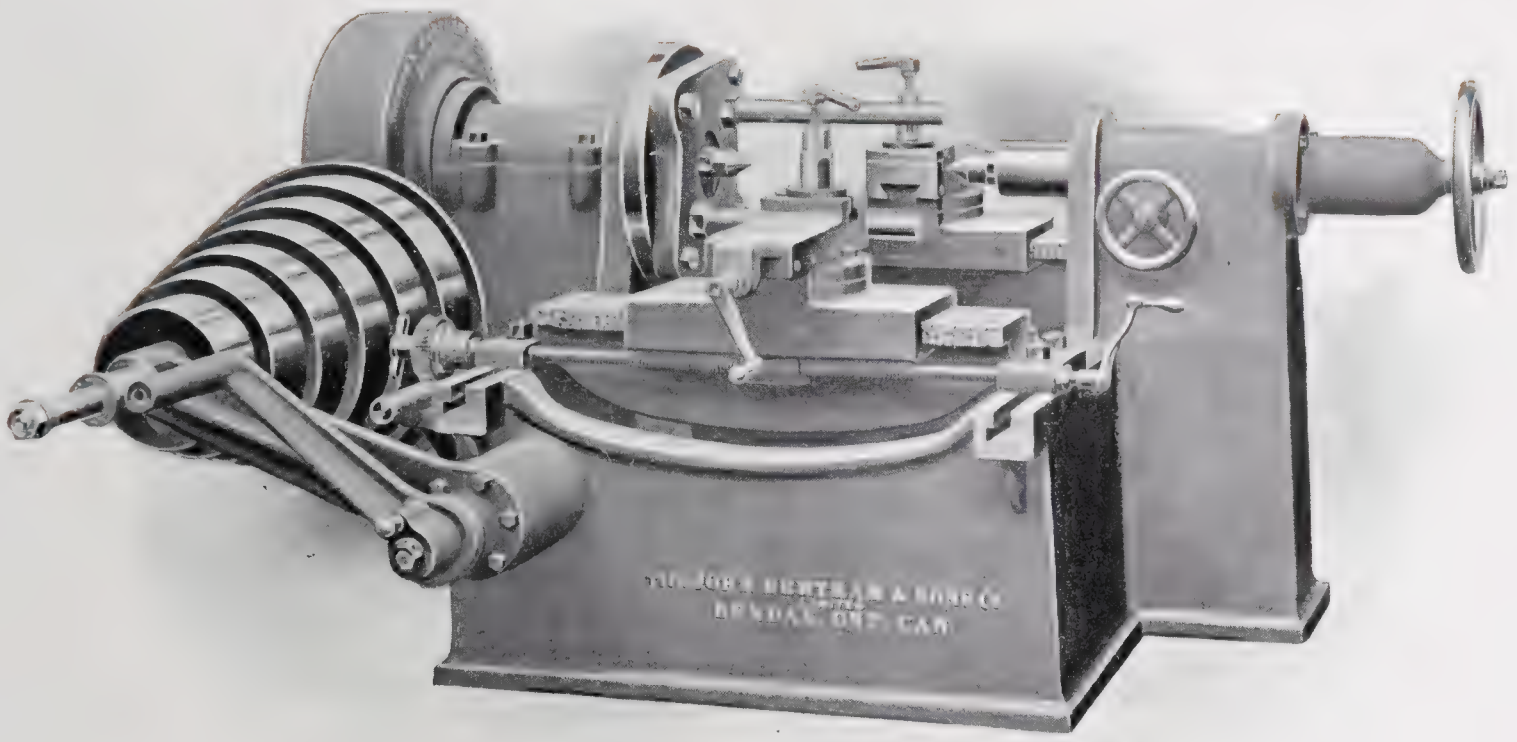


10-FOOT FACE LATHE

No. M-74

THIS lathe is designed for heavy boring and facing, and consists of a strong, powerful triple-geared head bolted to the foundation-plate. It has a steel spindle running in bronze-lined bearings. The cone has five steps for a wide belt. The face-plate is fitted to the live spindle with internal gear on back for driving by triple-gear. It has strong slide-rests, self-acting for boring or surfacing, operated by ratchet motion. A movable column carrying a tailstock and compound-rest, is fitted to an extended foundation-plate. The countershaft pulleys are 28 inches in diameter for 8-inch belt and should make 140 revolutions per minute.

Code-Word, with two pedestals . . . . . GNURREN
Code-Word, with tailstock . . . . . GNURRST



M 70

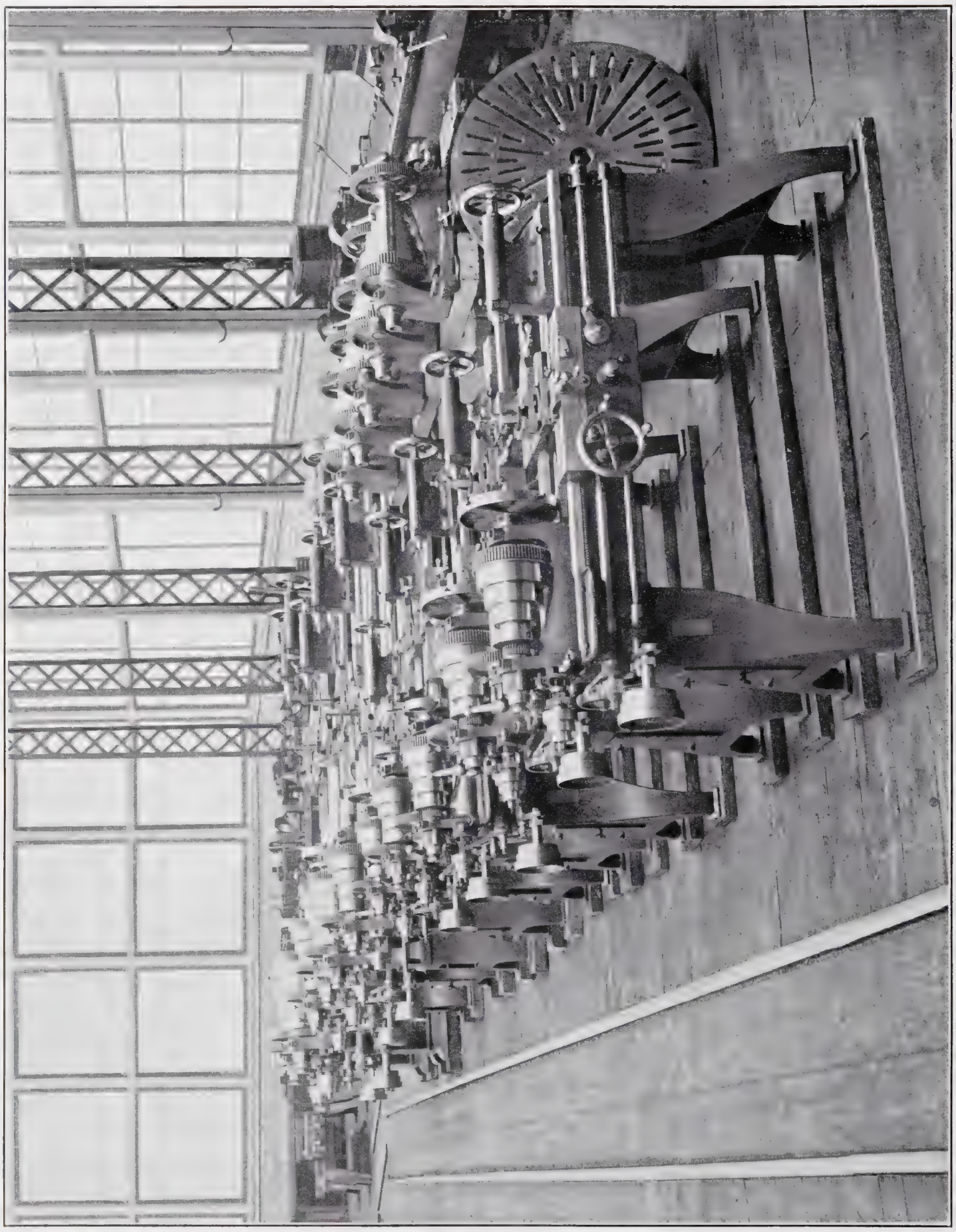
50-INCH PULLEY TURNING LATHE

No. M-70

ESPECIALLY designed for turning pulleys, spur and bevel gears and similar work up to 50 inches in diameter and 24-inch face. Power is transmitted through tangent gearing, giving a steady and powerful motion, which is particularly desirable for work of this nature.

The driving-cone has six steps for 4-inch belt, with ample range of speeds for all sizes of pulleys within the capacity of the machine.

Two tool-slides are provided, one on each side of the bed. The crossrails which carry the tool-slides are adjustable on a graduated surface to suit various diameters of pulleys, and have a swivel movement at one end to allow for crowning. One tool-slide has power longitudinal, cross and angular feed. The other has power longitudinal feed only and hand cross-feed.



INTERIOR VIEW

PLANING MACHINES

PLANING MACHINES

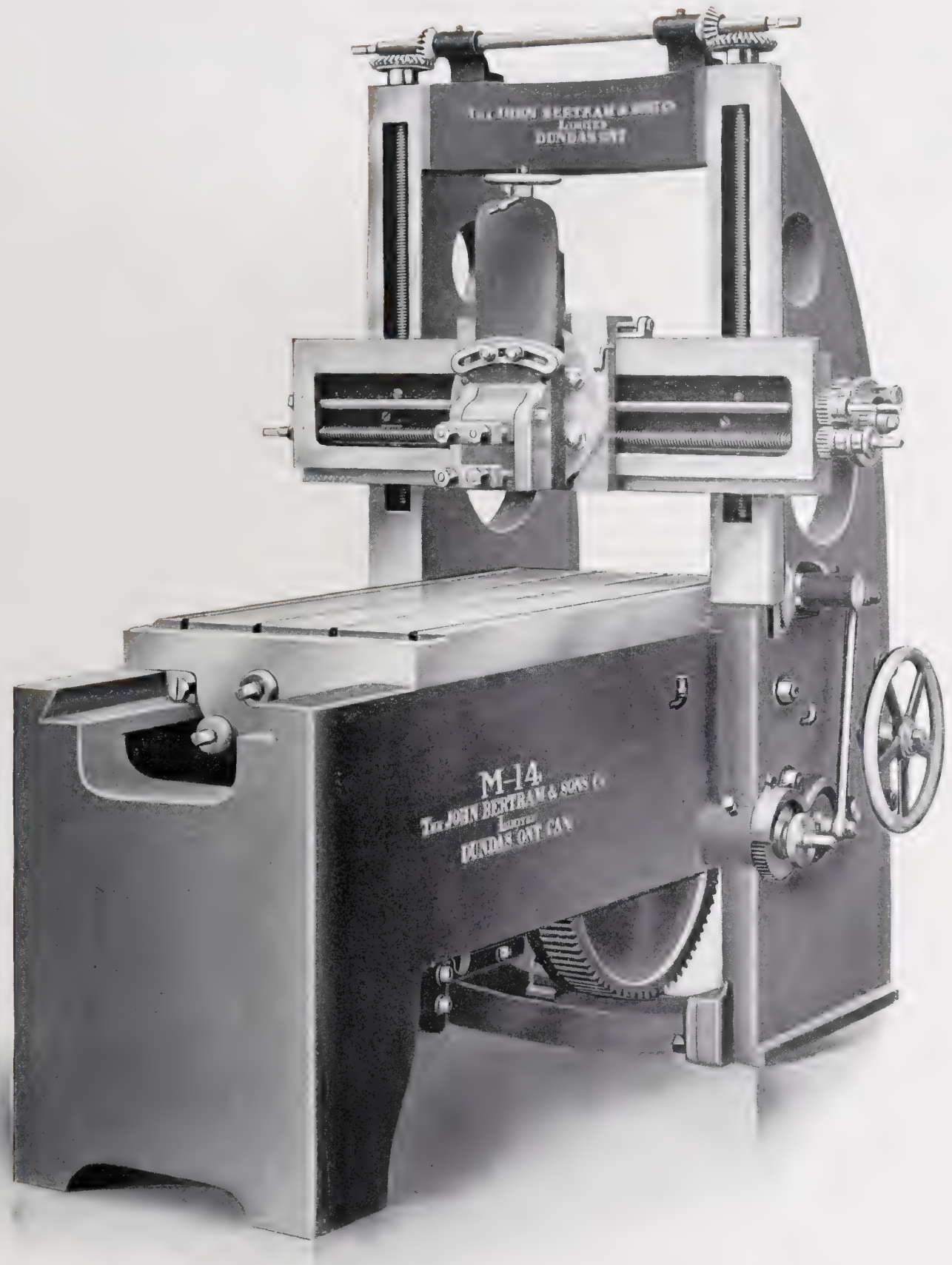
THE Standard Planing Machines, illustrated on the following pages, are of two general types: planers in which the table is driven by a train of spur gearing, and planers in which the table is driven by tangent gearing. In the first type the movement of the table is at right angles to the line-shaft, and in the second type the movement of the table is parallel to the line-shaft.

The beds are strengthened where the gearing and housings are mounted and are of sufficient length to prevent undue overhang of the table when at the extreme end of stroke. The housings are of box form with wide bases bolted to the sides of the bed its full depth. The crossrails are of box form, have deep, arched backs, and are of sufficient length when fitted with two heads to allow the front head to traverse across the entire distance between the housings. All sizes larger than 30 inches are elevated by power and fitted with one or two swivelling heads having independent cross, down and angular feed. On sizes including 36 inches and upwards, counterbalanced side-heads may be fitted to the uprights, and have automatic variable feeds in both directions from below the table to the highest point on the crossrail. The belt-shifter moves one belt entirely off the pulley before starting the other on and permits stopping the table instantly without stopping the belts. The reverse-dogs are of latch type and will clear the belt-shifter, allowing the work to be run from under the tool for inspection. On all sizes of planers the table may be stopped from either side of the machine.

DIMENSIONS

Size of Machine	Distance Between Housings	Height Under Crossrail	Standard Length of Table	Countershaft-Pulleys		*Code-Words	
				Dimensions	Revolutions	Parallel Drive with One Head	Square Drive with One Head
	Inches	Inches	Feet	Inches			
24 inch	24	24	6	14 x 4½	378	HAGZAUN	HAGZAWAT
30 "	30	30	8	15 x 5	376	HAHLGANS	HAHLGATE
36 "	36	36	8	18 x 5½	365	HAHMSEED	HAHMSEIL
36 " Heavy	36	36	10	18 x 5½	365	HAHNBART	HAHNBIEGER
42 "	42	42	10	18 x 6½	382	HAHNENBLUT	HAHNENEI
45 " Forge	45	45	12	18 x 6½	360	HAHNERN	HAHNICHT
48 "	48	48	12	18 x 6½	360	HAIARTIG	HAIAS
60 "	60	60	14	20 x 7	350	HAIFLOSSE	HAIHAKEN
72 "	72	72	16	24 x 9	395	HAILSTORM	HAILY
72 " Heavy	72	72	16	24 x 9	395	HAINE	HAINENACT
84 "	84	84	18	20 x 10	450	HAINERHOLZ	HAINES
96 "	96	96	20	20 x 11	450	HAINSIMSE	HAINSIMSEN

*These Code-words are for Planers equipped with one head on crossrail. For additional Code-words see descriptions of machines.

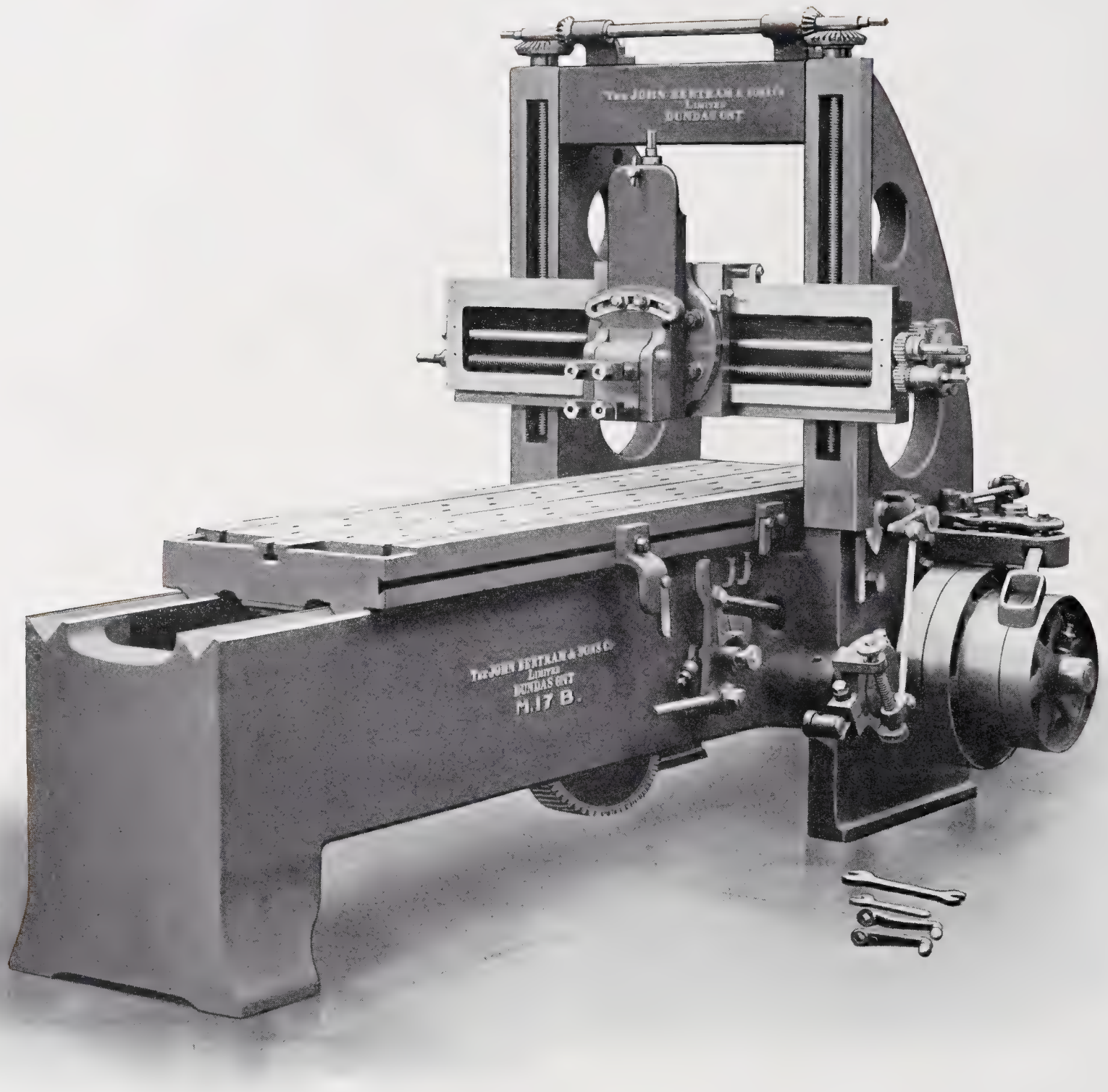


CRANK PLANER

No. M-11

PLANES 24 inches wide, 24 inches high, and 24 inches long. The table is 48 inches long and has quick return by crank motion and adjustment for any length or position of stroke. The adjustment of the stroke as well as the clamping of the nut is effected from the front end of table. The feed gear is positive, variable and self-acting in all directions. The movement of the table is at right angles to the line-shaft.

Code-Word . . . . . [illegible]



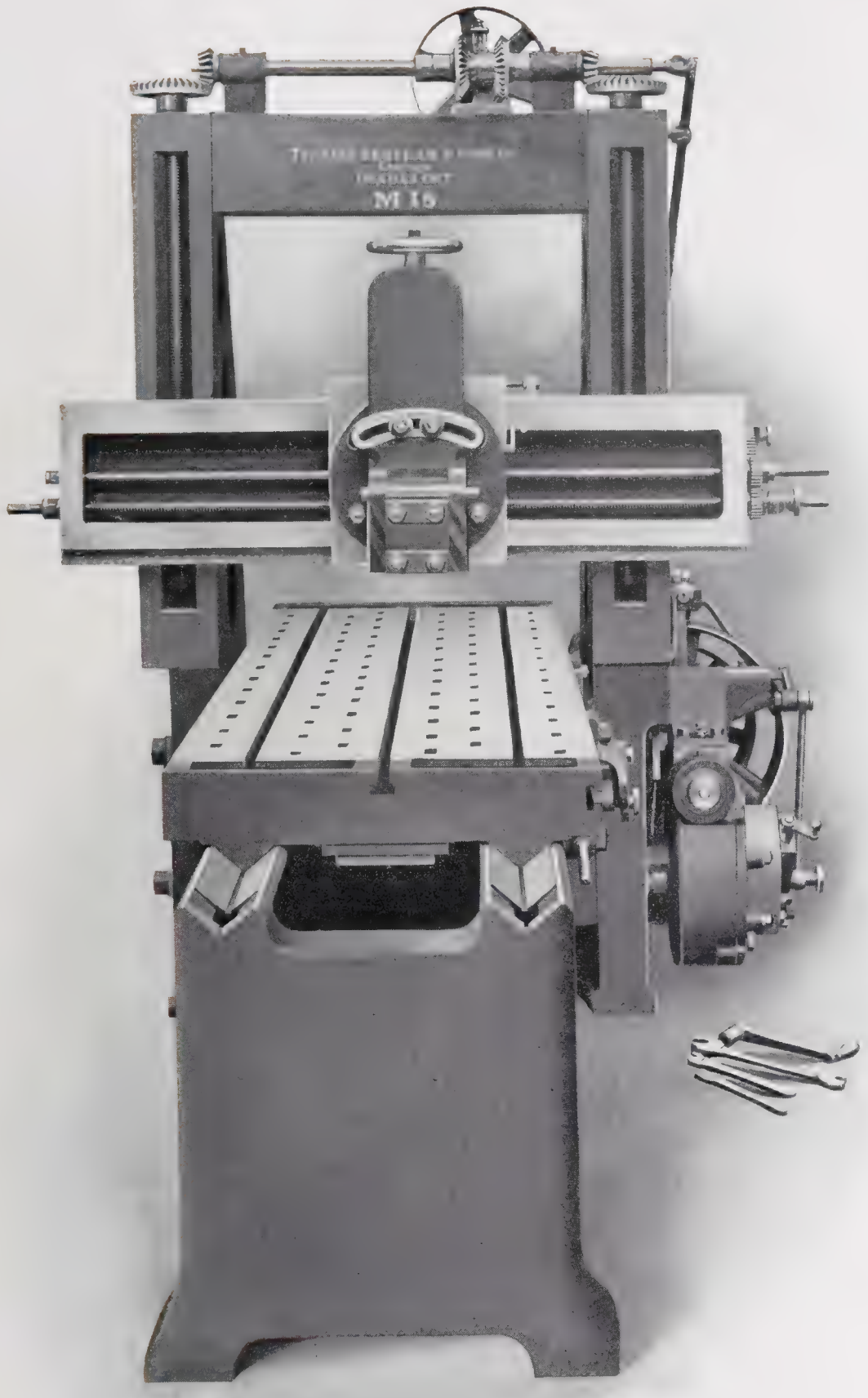
24-INCH PLANER

SQUARE DRIVE

No. M-17 B

PLANES 25 inches wide, 25 inches high, and any desired length. The movement of the table is at right angles to the line-shaft, but the machine may be built with parallel drive.

	Parallel	Square
Code-Word, with one head	HAGZAUN	HAGZAWAT

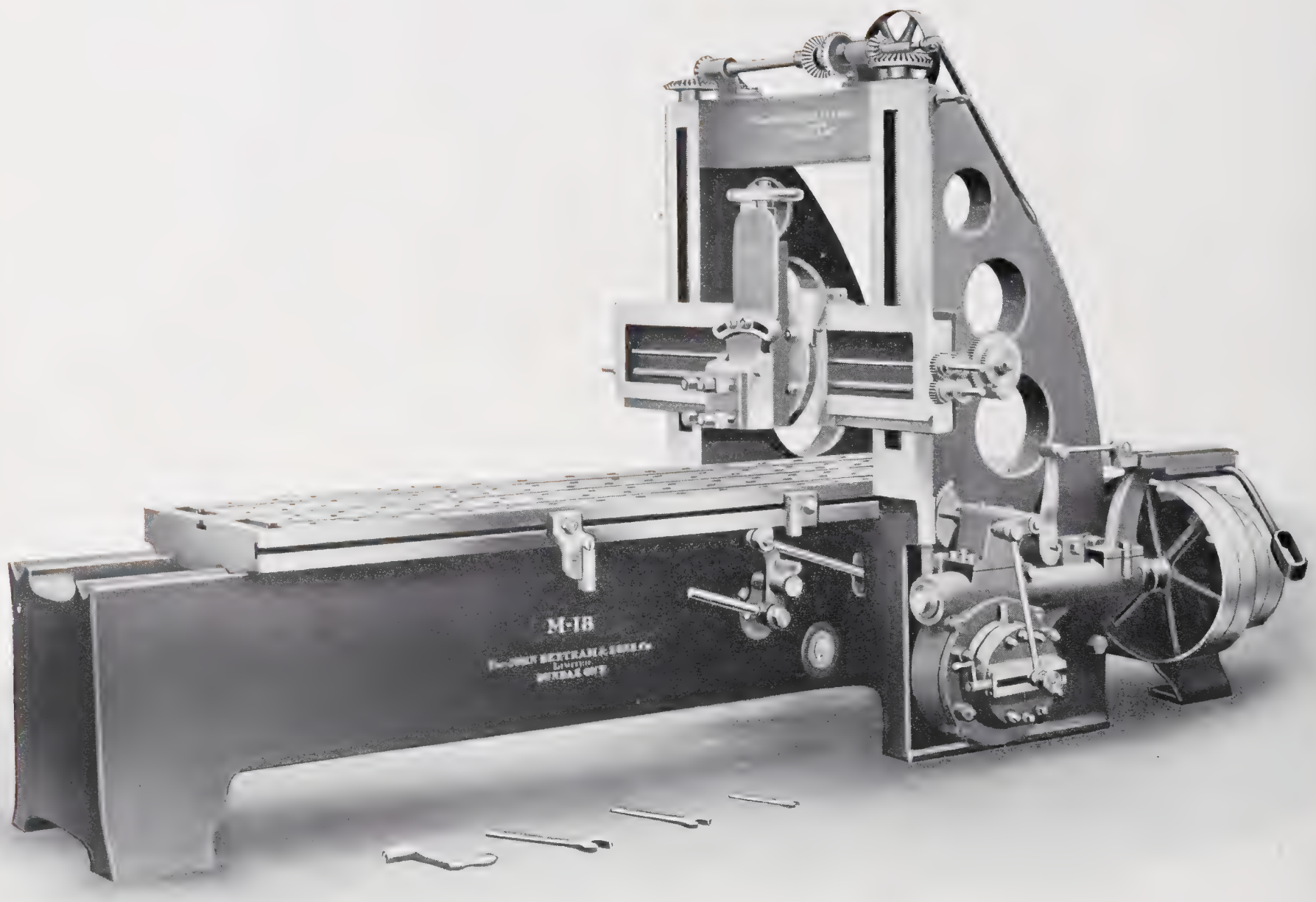


30-INCH PLANER

END VIEW, SHOWING PARALLEL DRIVE

No. M-18

PLANES 31 inches wide, 31 inches high and any desired length. The table is driven by tangent gear, which permits the machine to stand parallel to the line-shaft.



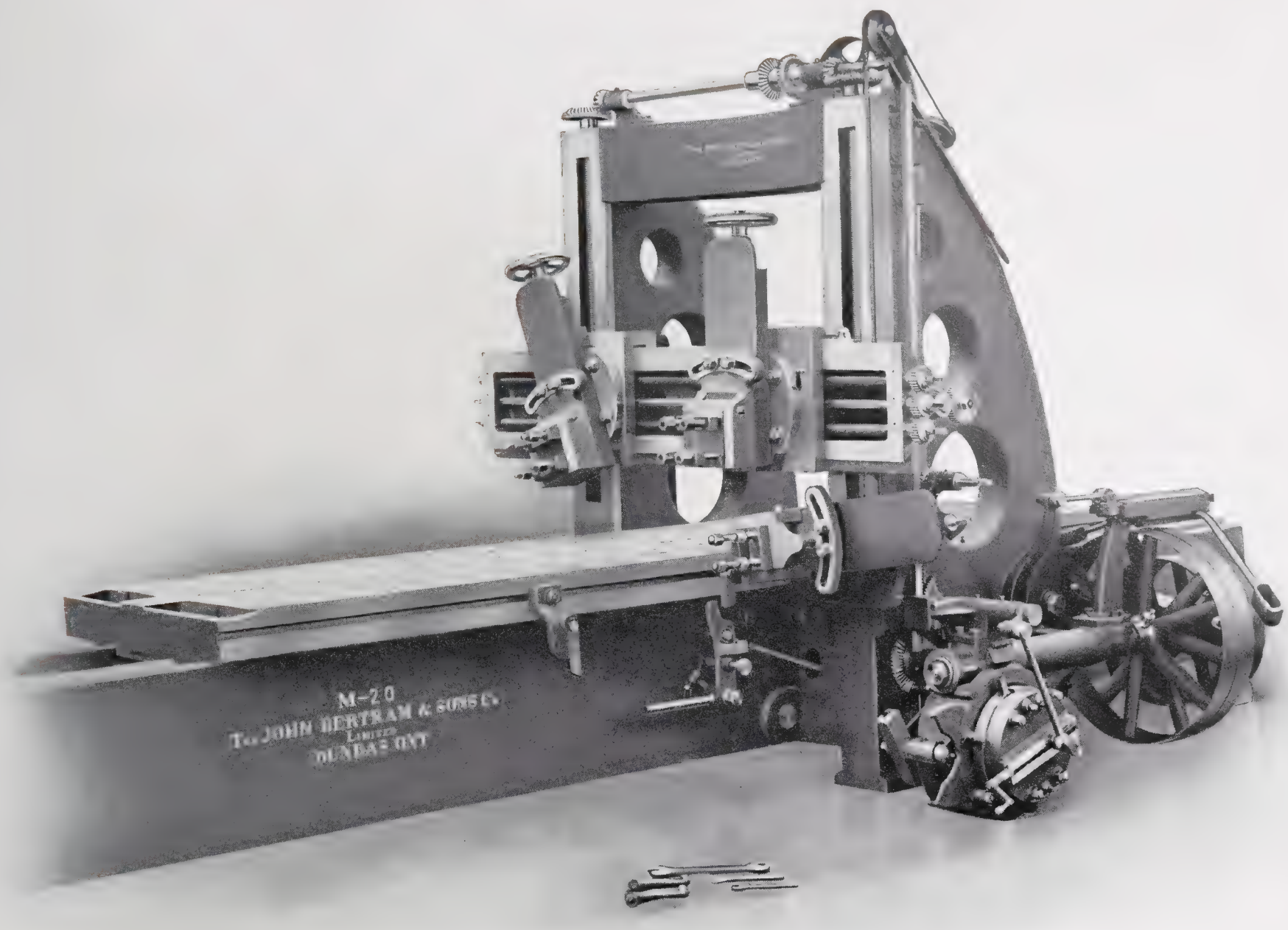
30-INCH PLANER

PARALLEL DRIVE

No. M-18

PLANES 31 inches wide, 31 inches high and any desired length. The movement of the table is parallel to the line-shaft, but the machine may be built with right angle drive.

	Parallel	Square
Code-Word, with one head on crossrail	HAHLGANS	HAHLGATE
Code-Word, with two heads on crossrail	HAHLKATZI	HAHLKATUM



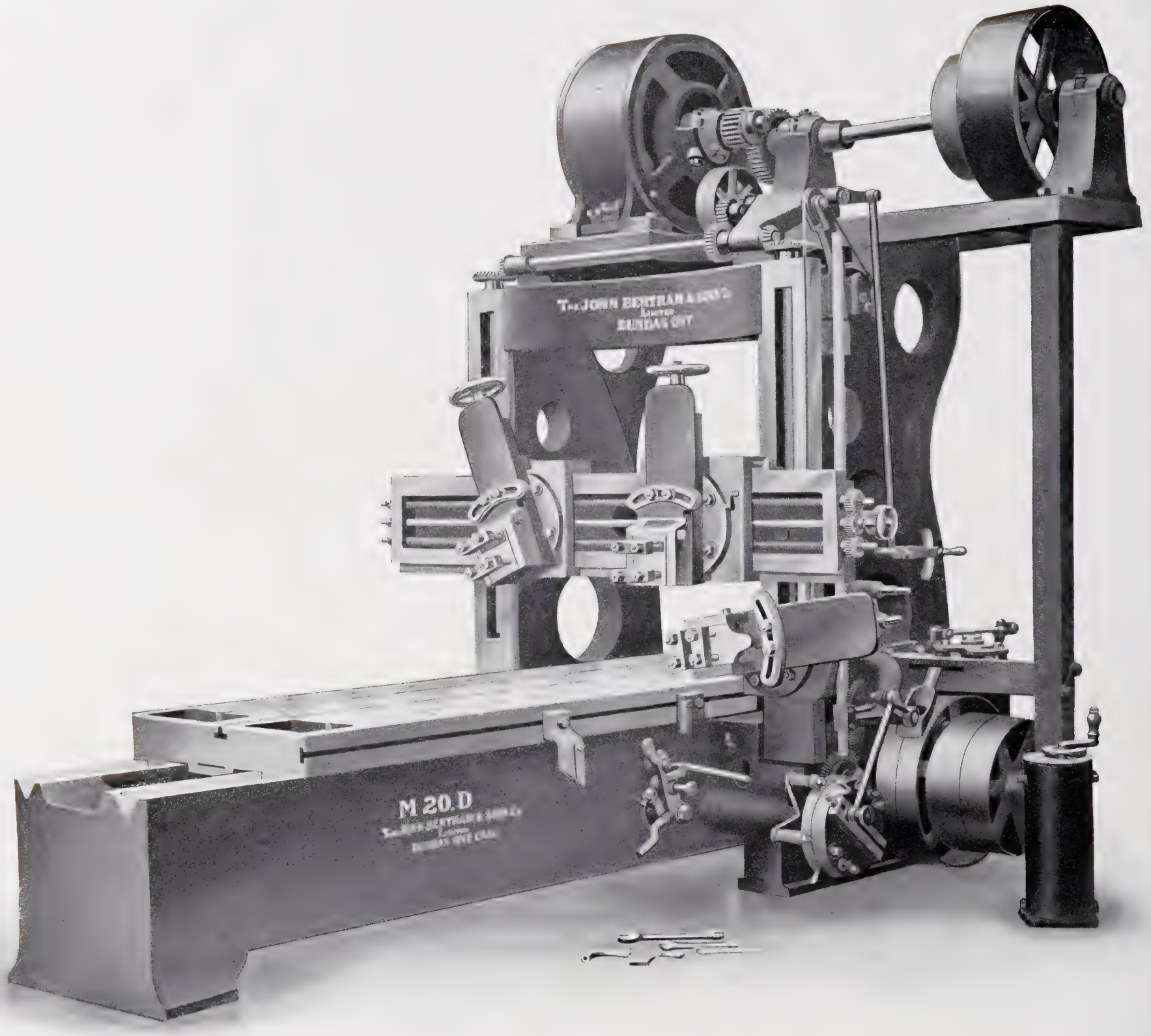
36-INCH PLANER

WITH SIDE HEAD AND PARALLEL DRIVE

No. M-20

PLANES 37 inches wide, 37 inches high and any desired length. This machine can be furnished with counterbalanced side-heads, which requires a slightly different construction from our standard 36-inch planer. The movement of the table is parallel to the line-shaft. Machine may be built to stand at right angles to the line-shaft.

	Parallel Drive
Code-Word, with two heads on crossrail	HAHNCHEN
Code-Word, with one head on crossrail and one side-head	HAHNBOHRER
Code-Word, with two heads on crossrail and two side-heads	HAHNEMANN



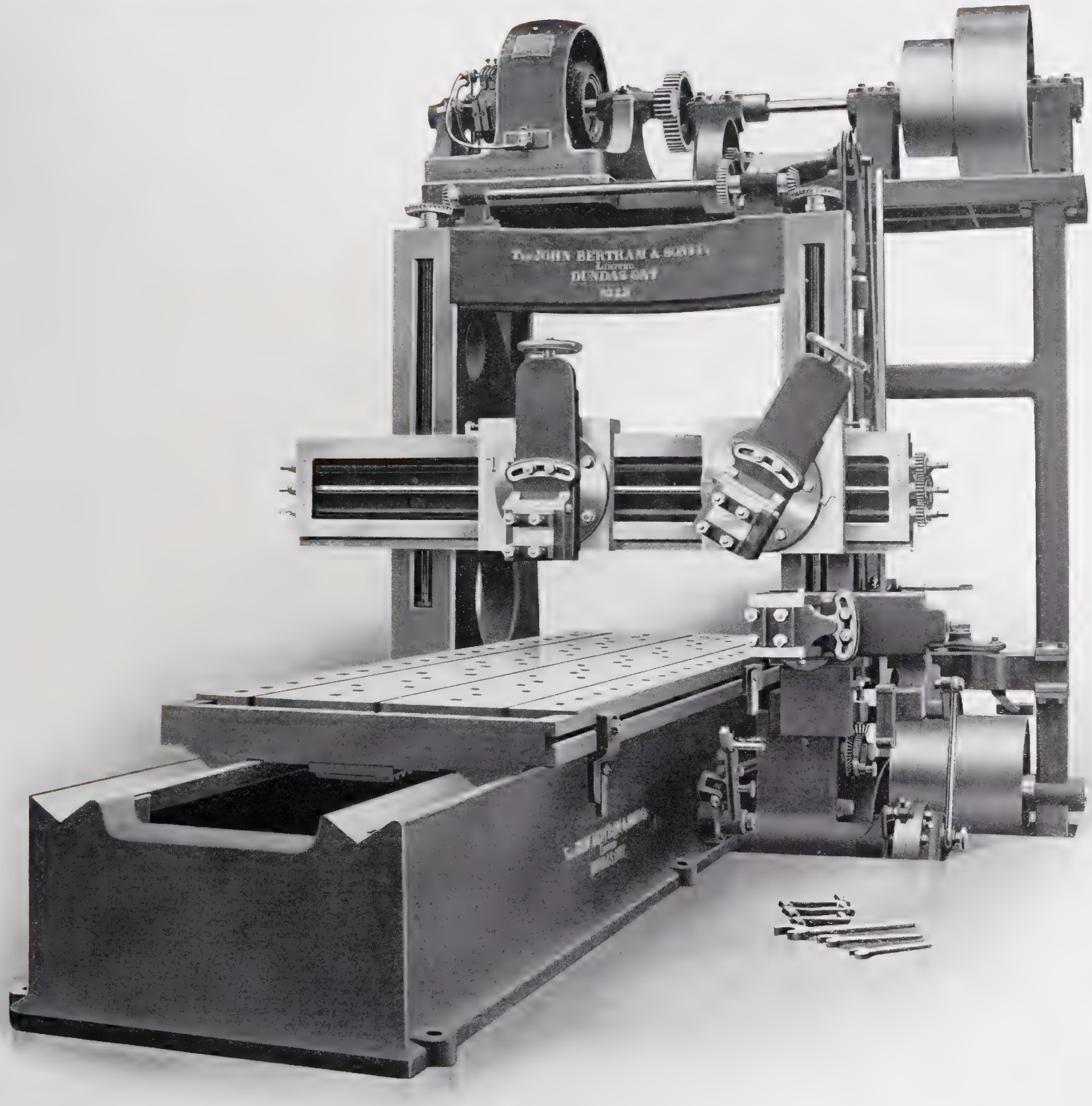
36-INCH PLANER

MOTOR DRIVEN

No. M-20 D

PLANES 37 inches wide, 37 inches high, and any desired length. Machine is fitted with one counterbalanced side-head, and driven by a motor mounted on top of housings.

	Square Drive
Code-Word, with two heads on crossrail	HAHNDORN
Code-Word, with one head on crossrail and one side-head	HAHNBREI
Code-Word, with two heads on crossrail and two side-heads	HAHNENBART
Code-Word, for direct-connected motor	ICEBERG



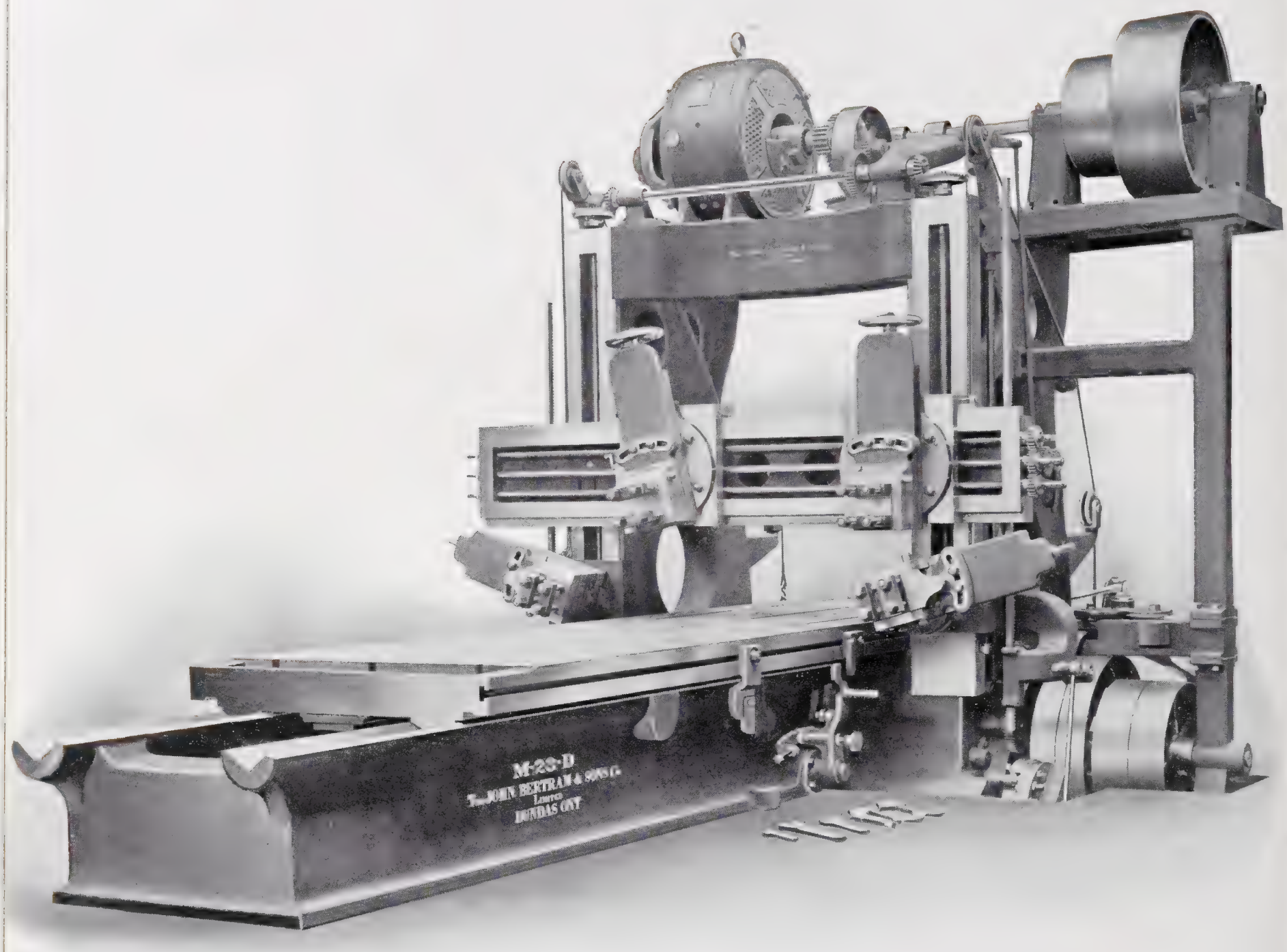
45-INCH FORGE PLANER

MOTOR DRIVEN

No. M-23 E

PLANES 50 inches wide, 50 inches high, and any desired length. The machine may be built with movement of table parallel or at right angles to the line-shaft. The heads on the crossrail are made right and left, with power cross, down, and angular feeds. It is fitted with a counterbalanced side-head, having power vertical and hand angular feeds. Our Forge Planers have all the advantages of our standard machines, and are more powerful and heavier in every respect.

Code-Word, with two heads on crossrail . . .	Square Drive
Code-Word, with one head on crossrail and one side-head. .	. HAHNMILL
Code-Word, with two heads on crossrail and two side-heads.	. HAHNJAGD
Code-Word, for direct-connected motor	. HAHNTRITT
	ICEBERG

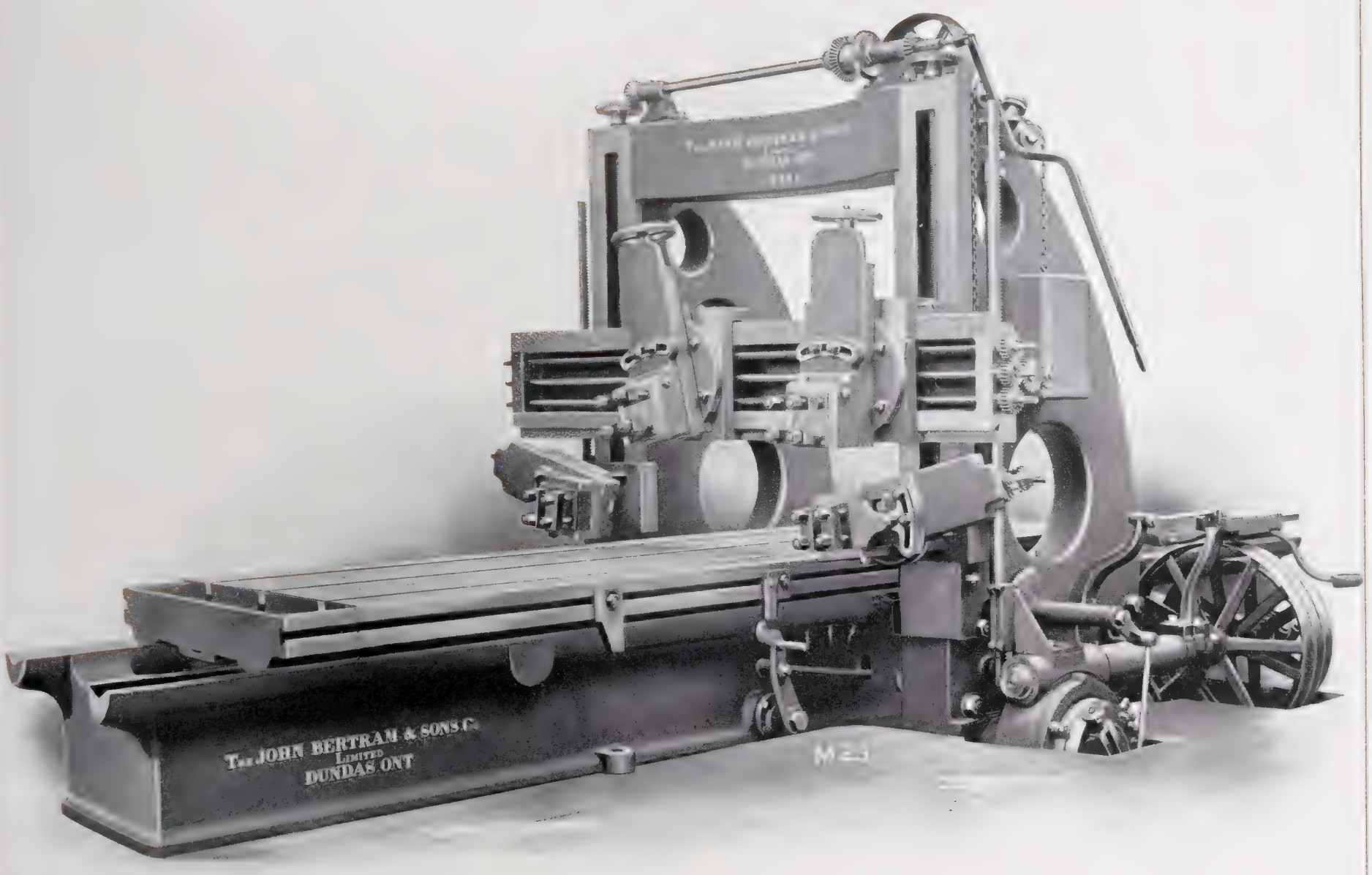


48-INCH PLANER

MOTOR DRIVEN

PLANES 49 inches wide, 49 inches high, and any desired length. Driven by constant-speed motor mounted on top of housings.

	Square Drive
Code-Word, with two heads on crossrail	HAIERAIENT
Code-Word, with one head on crossrail and one side-head	HAIDE
Code-Word, with two heads on crossrail and two side-heads	HAIFELL
Code-Word, for direct-connected motor	ICEBERG



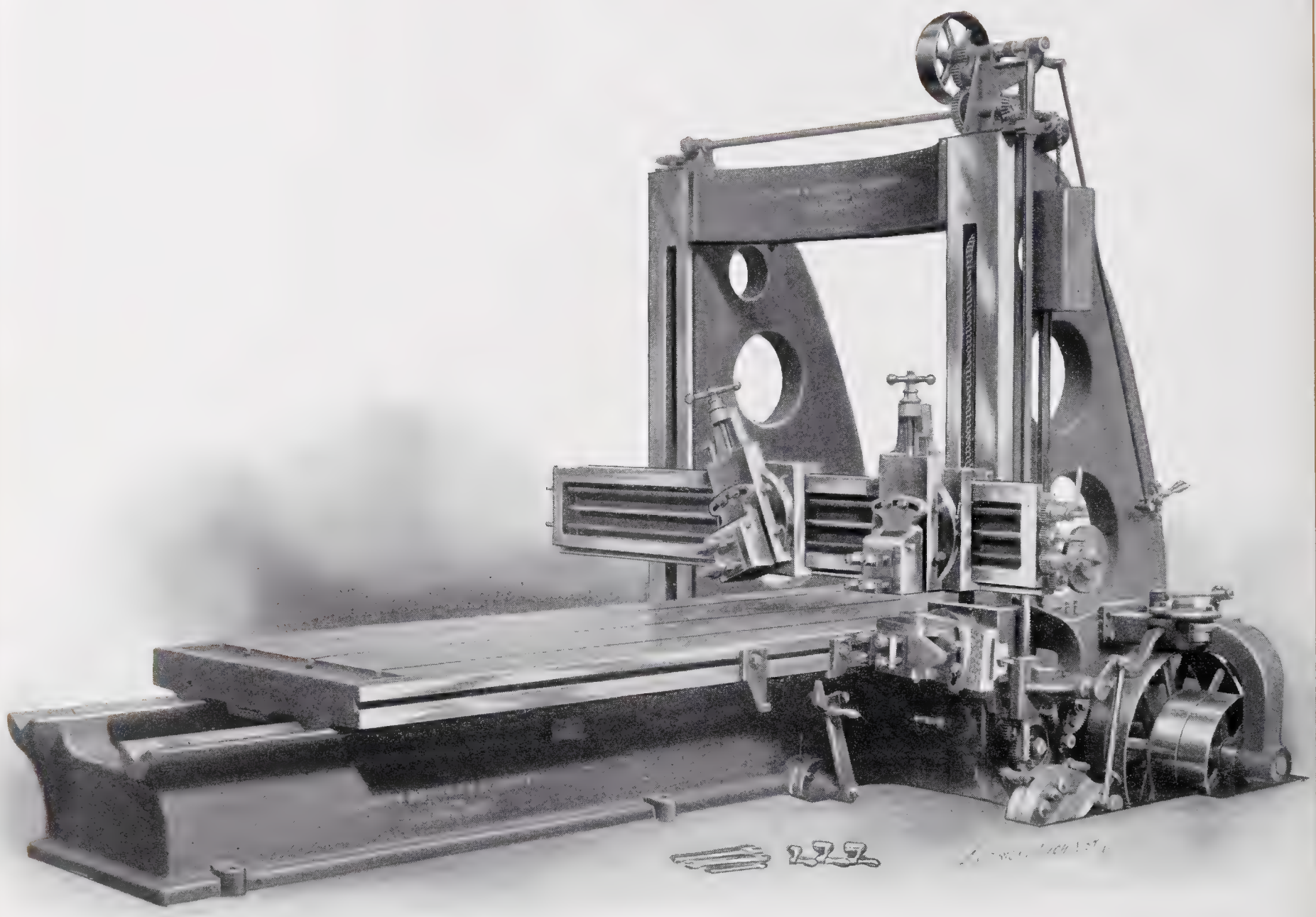
48-INCH PLANER

WITH SIDE-HEADS AND PARALLEL DRIVE

No. M-23

PLANES 49 inches wide, 49 inches high, and any desired length. The movement of the table is parallel to the line-shaft, but the machine may be built to stand at right angles to the line-shaft. The bed has "V's" having large wearing surfaces and oil pockets with rollers for lubricating the table.

	Parallel Drive
Code-Word, with two heads on crossrail	HAIERAI
Code-Word, with one head on crossrail and one side-head	HAICTITE
Code-Word, with two heads on crossrail and two side-heads	HAIERONT



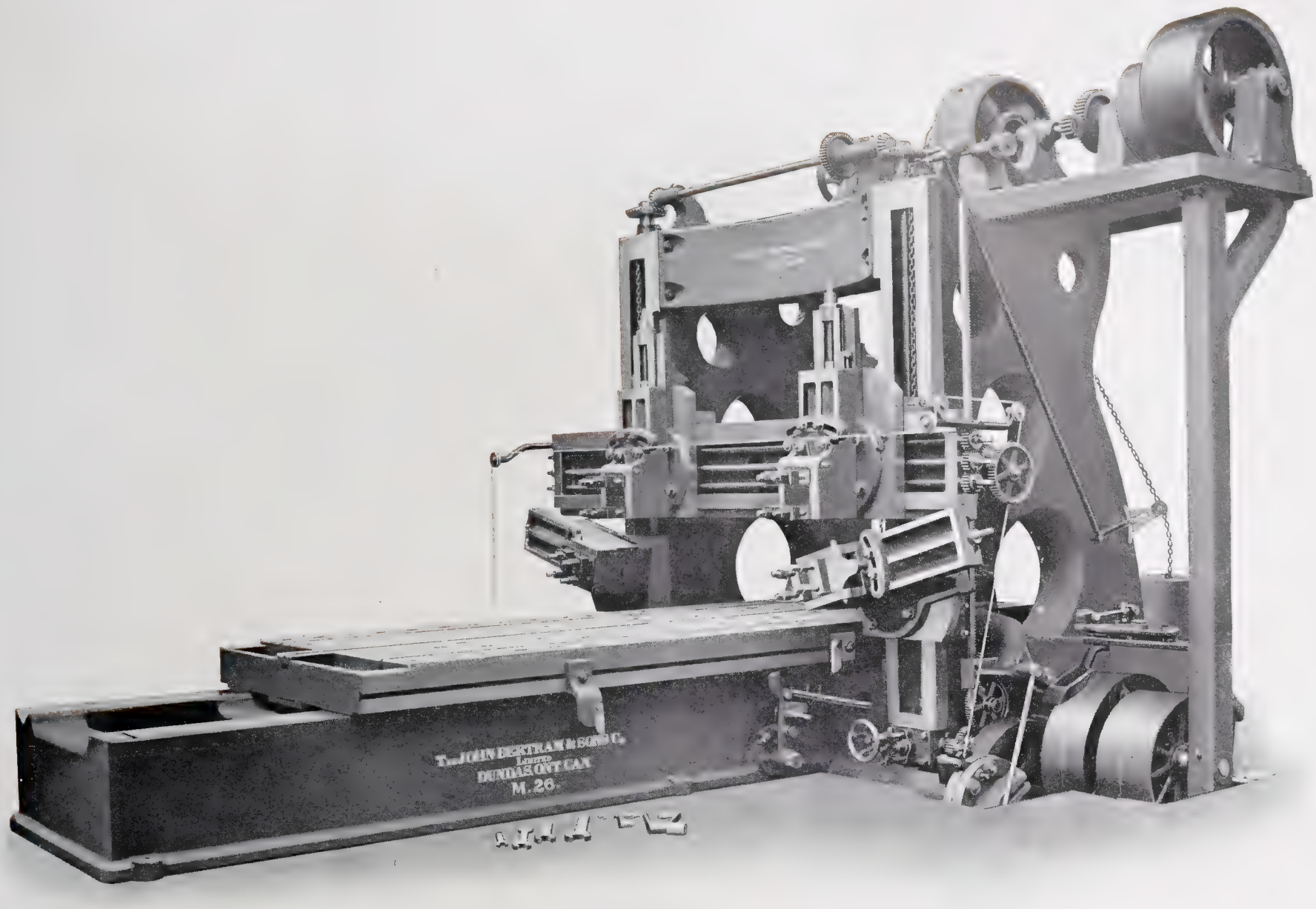
60-INCH PLANER

SQUARE DRIVE

No. M-25 B

PLANES 62 inches wide, 62 inches high, and any desired length. The movement of the table is at right angles to the line-shaft, but the machine may be built with parallel drive. The heads are made right and left and fitted to the crossrail by tapered gibs. Counterbalanced side-heads, having compound-swivelling movement, may be fitted to the uprights.

	Parallel Drive	Square Drive
Code-Word, with two heads on crossrail	HAILLON	HAILMIXED
Code-Word, with two heads on crossrail and one side-head	HAILSE	HAILSOME
Code-Word, with two heads on crossrail and two side-heads	HAILSQUALL	HAILSTONES
Code-Word, for direct-connected motor		ICEBERG



72-INCH PLANER

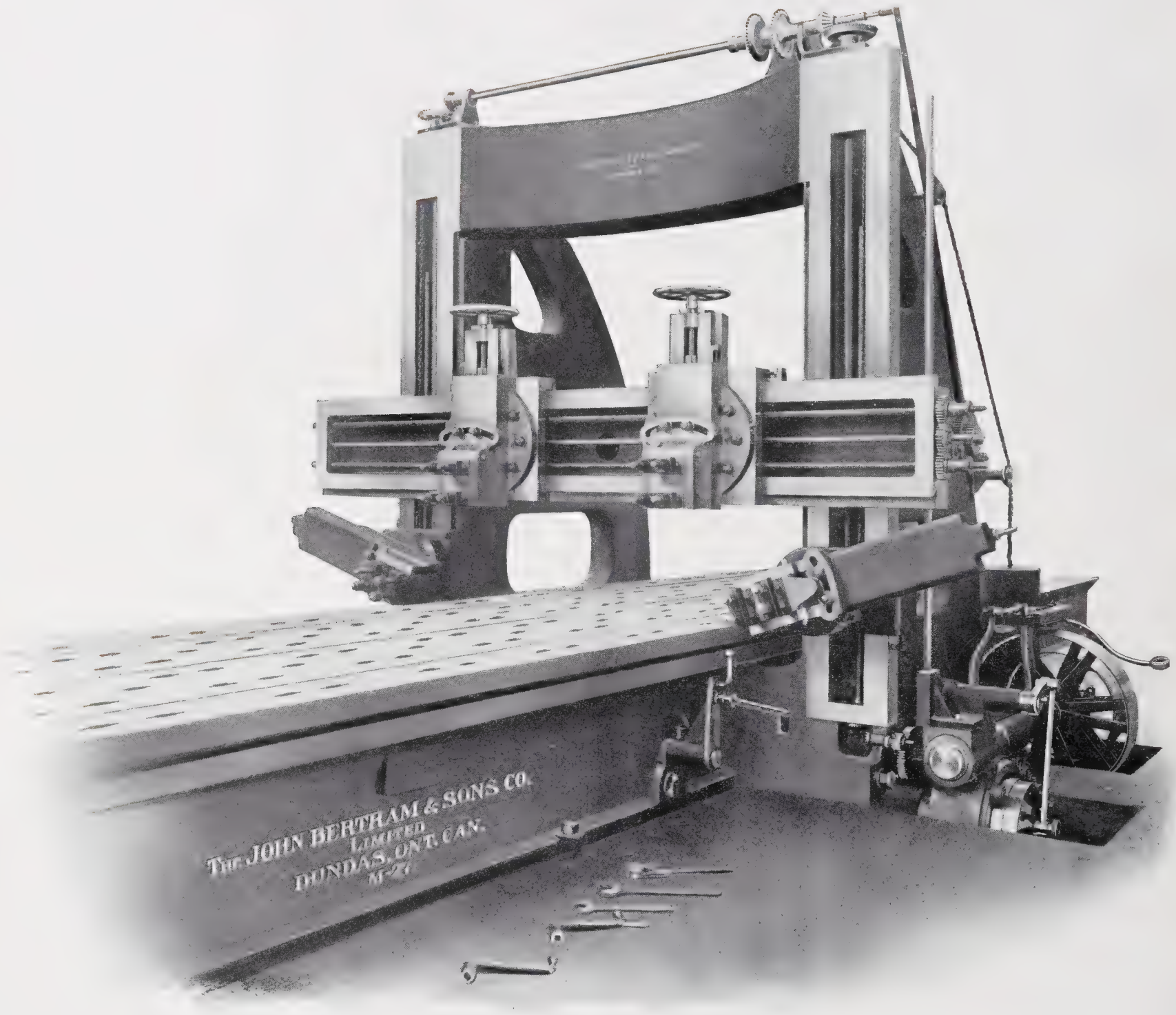
MOTOR DRIVEN

No. M-26

PLANES 73 inches wide, 73 inches high, and any desired length. This is a specially heavy machine, designed for planing locomotive cylinders and other work requiring great power. The table traverses on one V and one flat track having large wearing surface and oil pockets with rollers for lubricating the table. The heads on crossrail are made right and left, bringing the tools close together.

The machine is operated by two motors, one transmitting power to the table and a smaller motor is used for raising and lowering the crossrail and also the side-tools.

	Parallel Drive	Square Drive
Code-Word, with two heads on crossrail	HAINENFAT	HAINENGIB
Code-Word, with two heads on crossrail and one side-head	HAINBUCHE	HAINBUSCH
Code-Word, with two heads on crossrail and two side-heads	HAINBUTTE	HAINDORN
Code-Word, for direct-connected motor		ICEBERG



84-INCH PLANER

PARALLEL DRIVE

No. M-27

PLANES 84 inches wide, 84 inches high, and any desired length. The movement of the table is parallel to the line-shaft, but the machine may be built to stand at right angles to the line-shaft. The heads are made right and left with outside aprons and positive automatic tool-lifters. The counterbalanced side-heads fitted to the uprights have compound-swivelling movement and automatic variable feeds in both directions from below the table to the highest position of the crossrail.

	Parallel Drive	Square Drive
Code-Word, with two heads on crossrail	HAINGETON	HAINGRAS
Code-Word, with two heads on crossrail and one side-head	HAINHIEFE	HAINOUSLY
Code-Word, with two heads on crossrail and two side-heads	HAINRISPE	HAINSCHAUB
Code-Word, for direct-connected motor		ICEBERG

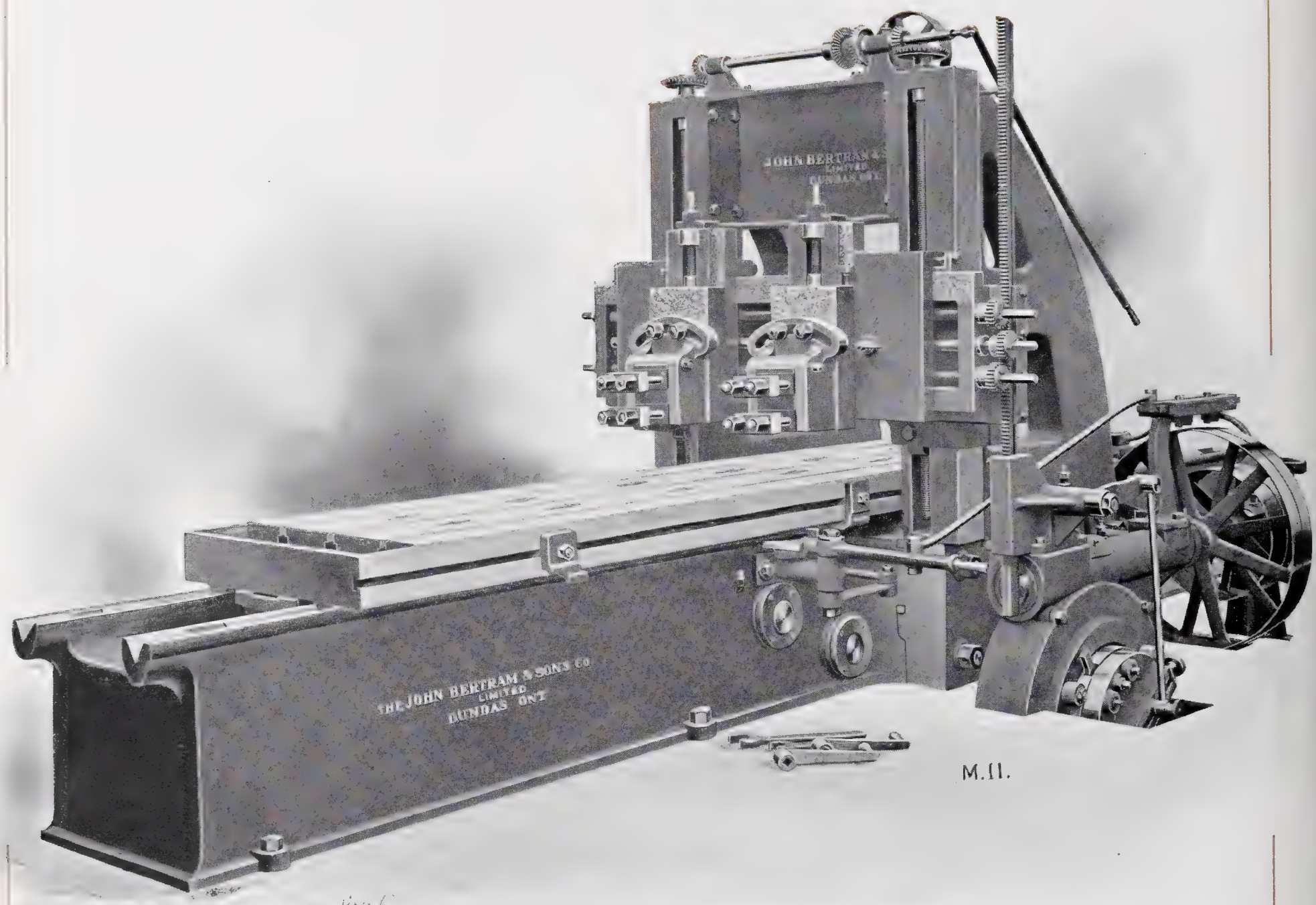
FROG AND SWITCH PLANERS

THE rapid planing of railway frogs and switches is entirely beyond the capacity of the standard planer as ordinarily constructed. To do this class of work economically necessitates broad cuts and coarse feeds, which, in material as hard as steel rails, require a more powerful train of gear and a heavier designed machine.

Crossrails and heads are made of great strength throughout. It is desirable to have as few parts as possible so as to avoid lost motion, hence the heads have no swivelling motion, the tool-box being set directly on the saddle. Power cross and down feeds are provided. The tables are heavy and run in deep ways, so as to resist pressure of the side cuts.

DIMENSIONS

Size	Distance Between Housings	Maximum Height Under Crossrail	Usual Length to Plane	Countershaft-Pulleys		Code-Word
				Dimensions	Revolutions	
Inches	Inches	Inches	Feet	Inches		
[illegible]	[illegible]	36	12, 14 and 16	15	412	[illegible]
48	48	12	14, 18 and 22	[illegible]	400	HALBIERST



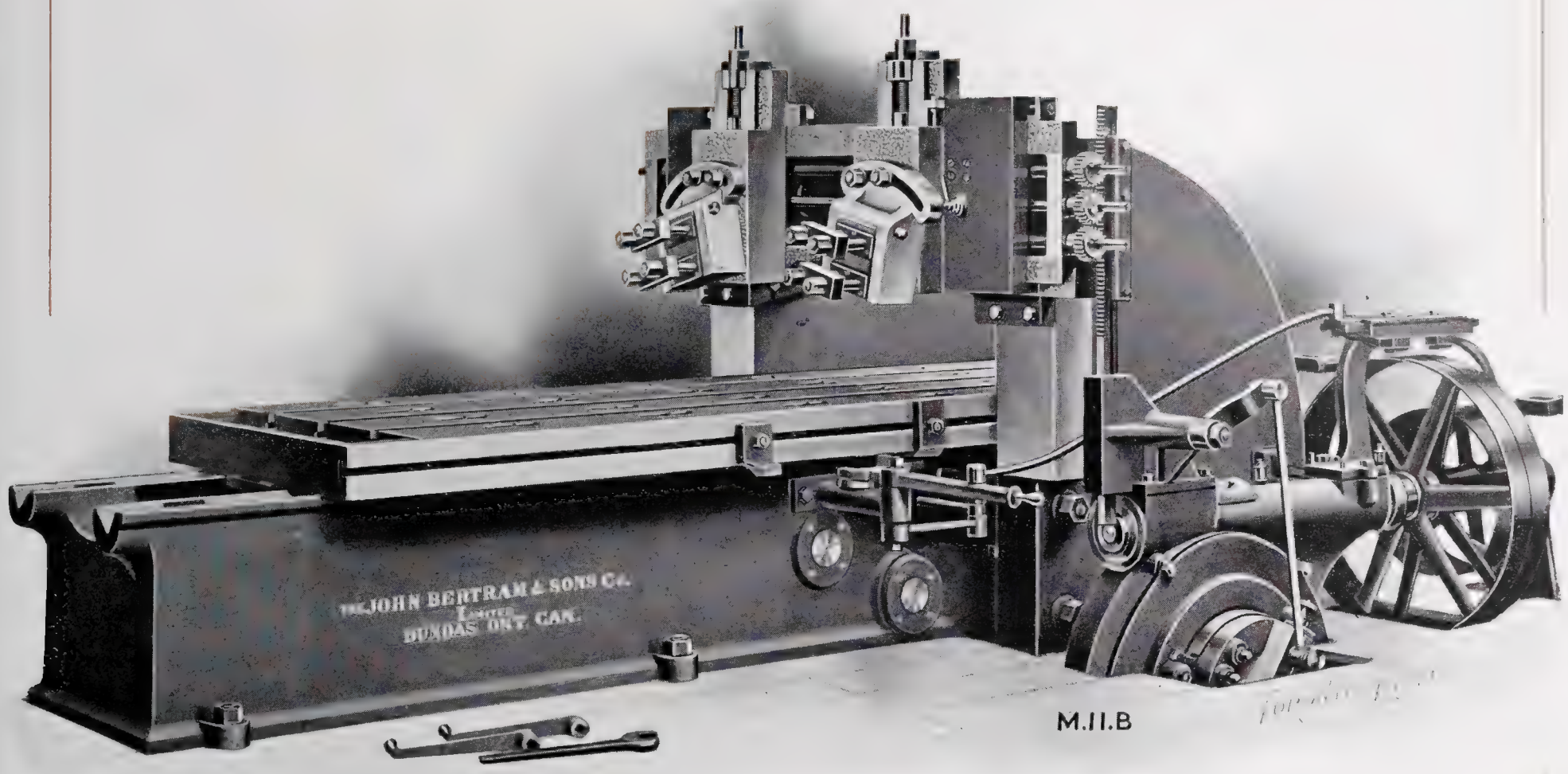
M.11.

36 x 36-INCH FROG AND SWITCH PLANER

No. M-11

PLANES 36 inches wide, 36 inches high, and any desired length. The movement of the table is parallel to the line-shaft. The table is heavy and runs in deep ways of unequal angles so as to resist lifting. The heads are made right and left and have power cross and down feeds. The tool-boxes swivel to give clearance to the tools.

Code-Word, with two heads on crossrail. . . . . HALBHOF



M.11.B

48 x 12-INCH FROG AND SWITCH PLANER

No. M-11 B

PLANES 48 inches wide, 12 inches high, and any desired length. The movement of the table is parallel to the line-shaft. This machine is similar to the 36 x 36-inch Frog and Switch Planing Machine with the exception that the crossrail is bolted to the housings 12 inches above the table.

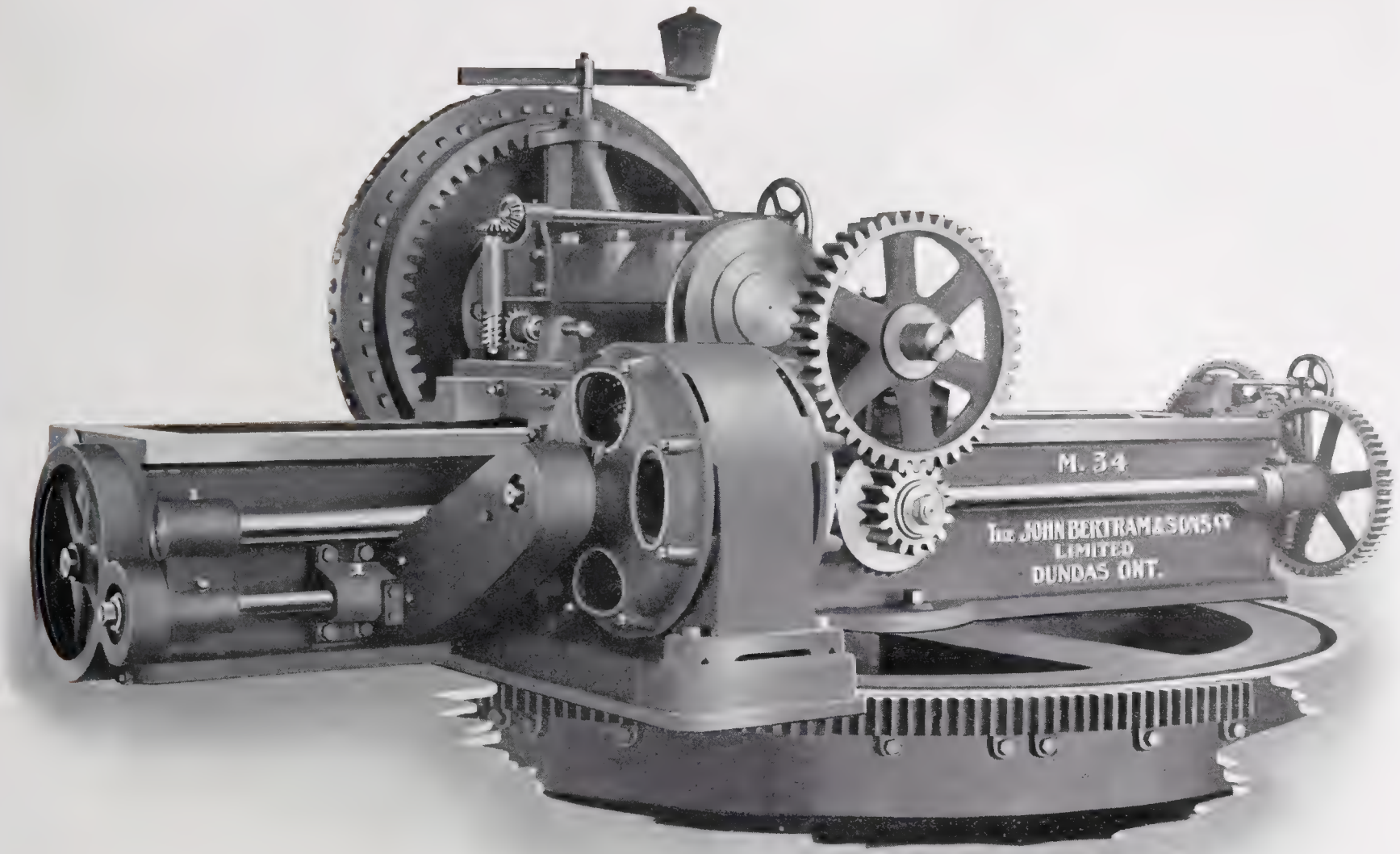
Code-Word, with two heads on crossrail

ROTARY PLANING MACHINES

THESE machines may be made with stationary bedplate or mounted on a circular base and arranged to swivel in either direction. The saddles have three changes of automatic feed, hand-adjustment and rapid power-movement in either direction. The spindle bearing is in a traversing slide having adjustment to regulate the depth of cut. These machines are driven either by an electric motor or tight and loose pulleys through a train of gear to large internal gear on cutting-head.

DIMENSIONS

Size of Machine	Diameter of Cutting Circle	Usual Traverse of Saddle	Length to Plane	In and Out Adjustment of Face-plate	Countershaft-Pulleys		Code-Word
					Dimensions	Revolutions	With Stationary Base
Inches	Inches	Ft. & In.	Ft. & In.	Inches	Inches		
40	40	6—6	4—9	3	30 x 7	190	[illegible]
42	[illegible]	6—6	4—6	[illegible]	32 x 7	200	[illegible]
50	52	[illegible]	6	[illegible]	36 x 7	200	HANGERSON
60	64	10	[illegible]	4	36 x 8	225	HANGIG



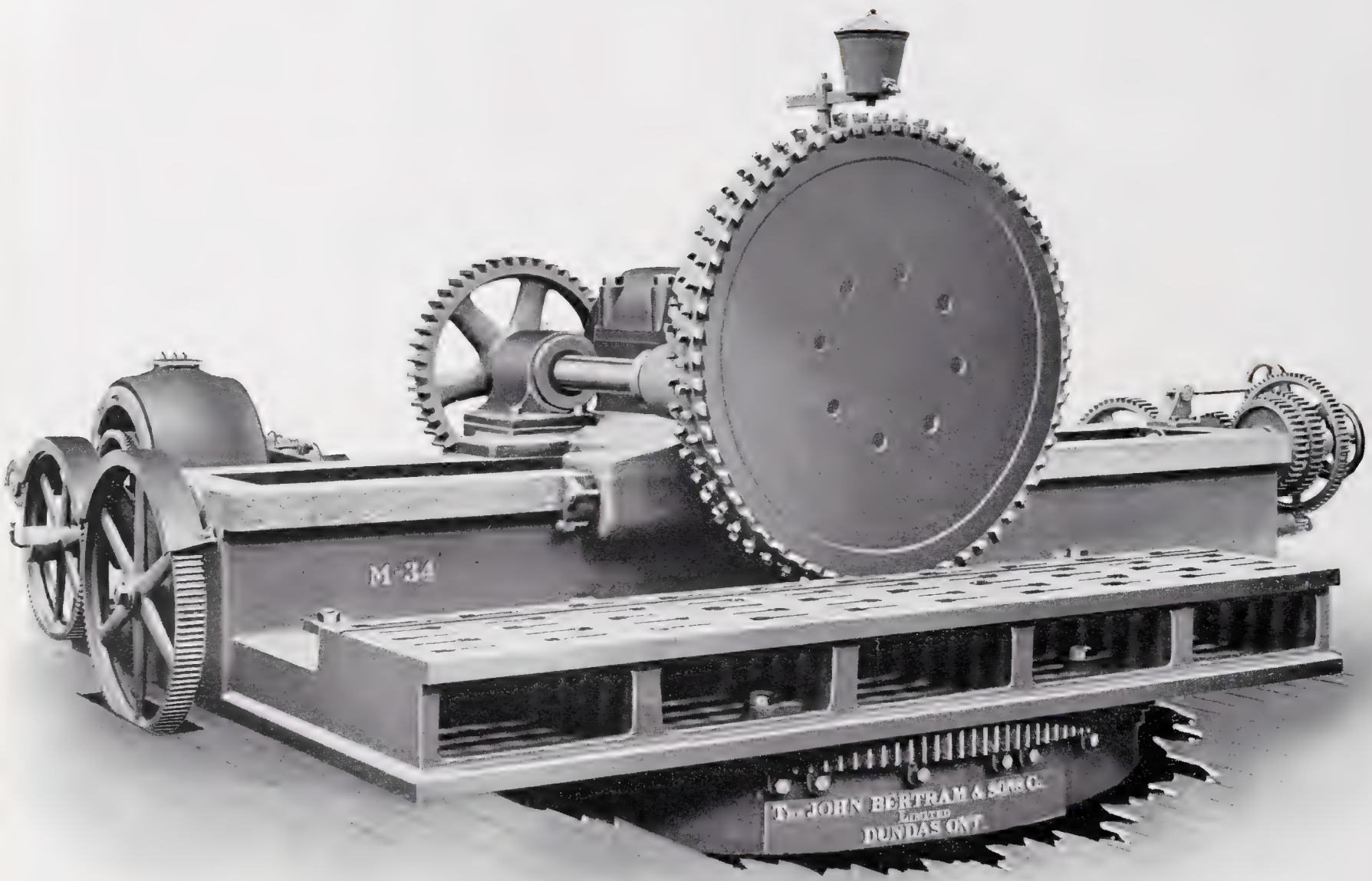
36-INCH ROTARY PLANING MACHINE

MOTOR DRIVEN

No. M-33

THIS machine is mounted on a circular base, arranged to swivel for facing work at any angle. The cutting-head is 40 inches in diameter and has 42 tools. The saddle has a traverse of 6 feet 6 inches, and will plane 4 feet 9 inches long. The adjustment of the cutting-head is by the hand-wheel shown to the right of the carriage. The machine may be built without swivelling table if required. It can be driven either by pulleys through a train of gear into internal gear on face-plate or by an electric motor, as shown.

Code-Word, with stationary base	[illegible]
Code-Word, with circular base. . . .	HANGELN
Code-Word, for direct-connected motor. .	ICEBERG



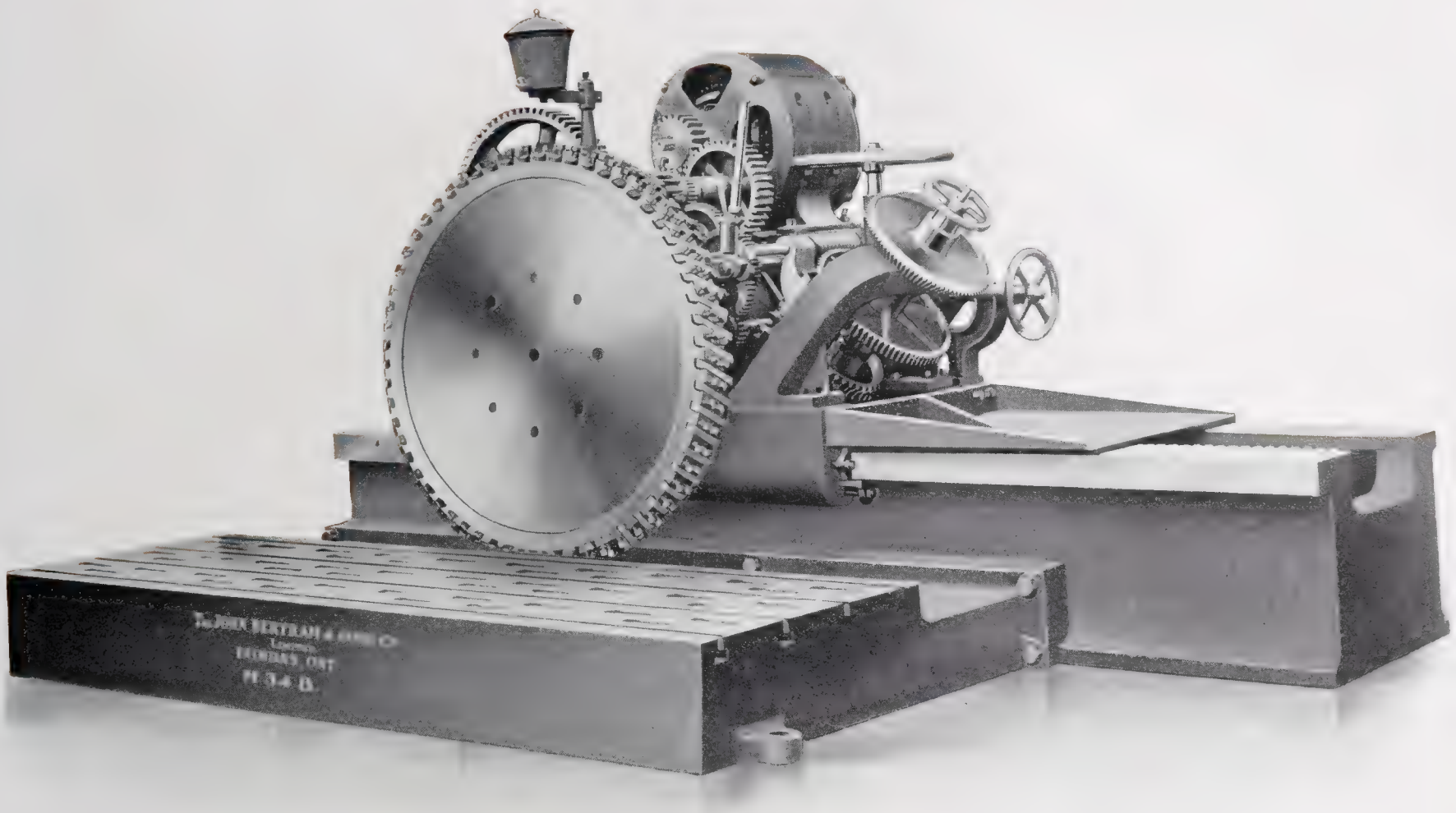
50-INCH ROTARY PLANING MACHINE

MOTOR DRIVEN

No. M-34

THIS machine is mounted on a circular base, arranged to swivel for facing work at any angle. The cutting-head is 52 inches in diameter and has 62 tools. The saddle has a traverse of 8 feet and will plane 6 feet long. The face-plate has 3½-inch in-and-out adjustment for depth of cut. All the movements are from one position convenient to the operator. This machine may be built without swivelling-base if required. It can be driven either by pulleys through a train of gear into internal gear on face-plate or by an electric motor.

Code-Word, with stationary base.	HANGERSON
Code-Word, with circular base.	HANGESTOCK
Code-Word, for direct-connected motor	[illegible]



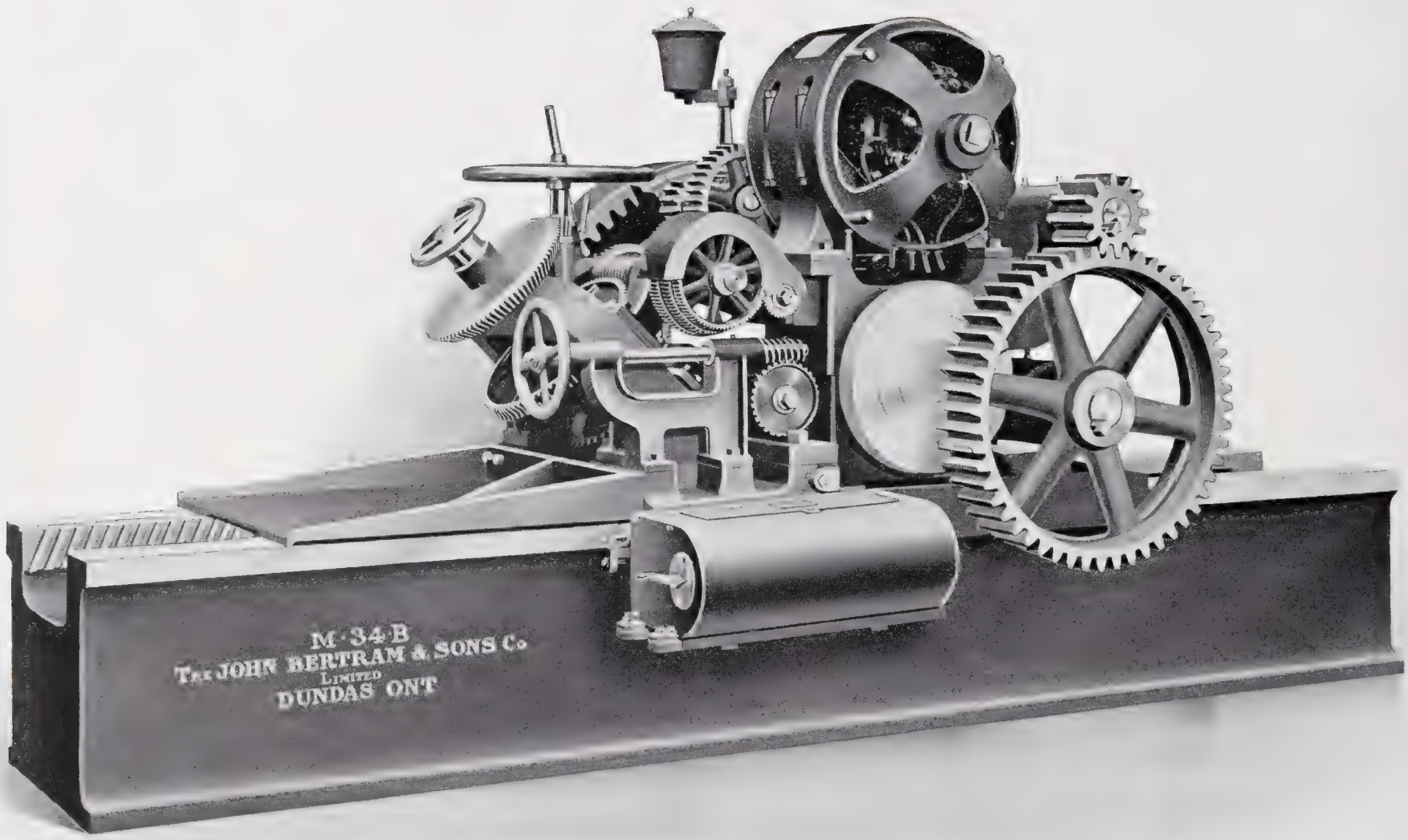
60-INCH ROTARY PLANING MACHINE

MOTOR DRIVEN

No. M-402

THIS machine is mounted on a fixed base. The cutting-head is 64 inches in diameter. The saddle has a traverse of 10 feet and will plane 7 feet 6 inches long. The face-plate has 4-inch in-and-out adjustment for depth of cut.

Code-Word, with stationary base	HANGIG
Code-Word, with circular base	HANGINGS
Code-Word, for direct-connected motor	[illegible]



60-INCH ROTARY PLANING MACHINE

MOTOR DRIVEN

No. M-102

THIS machine is entirely self-contained, a motor with a 3 to 1 variation being mounted on the saddle. The cutting-head is 64 inches in diameter and has 75 tools. The face-plate has three changes of feed for each motor speed and has 4-inch in-and-out adjustment, and is reinforced by an adjustable support. The saddle has rapid power-traverse in either direction along the bed. All movements of the machine are easily controlled from the operator's platform, which is attached to the saddle.

SHAPING MACHINES

THE Shaping Machine is very useful and convenient on short and light work, and is more economical than a planer on account of the great ease with which the work can be set and the machine adjusted, and when fitted with swivel-vise, index-centers and cone-arbors, having power rotary motion, it may be used to advantage for a great many purposes.

In the ordinary Crank Shaping Machines, which are described first, the work is fed under the tool by movement of the table. In the travelling-head shaping machines, which are described also, the cutter-bar is carried in a head which has adjustable movement and variable power feeds along the bed. Travelling-Head Shaping Machines may be furnished with one or two heads, as desired. The cutter-bars in both types of machines have quick-return and adjustment for any length or position of stroke. The tool-slides have vertical adjustment and swivel to any angle.

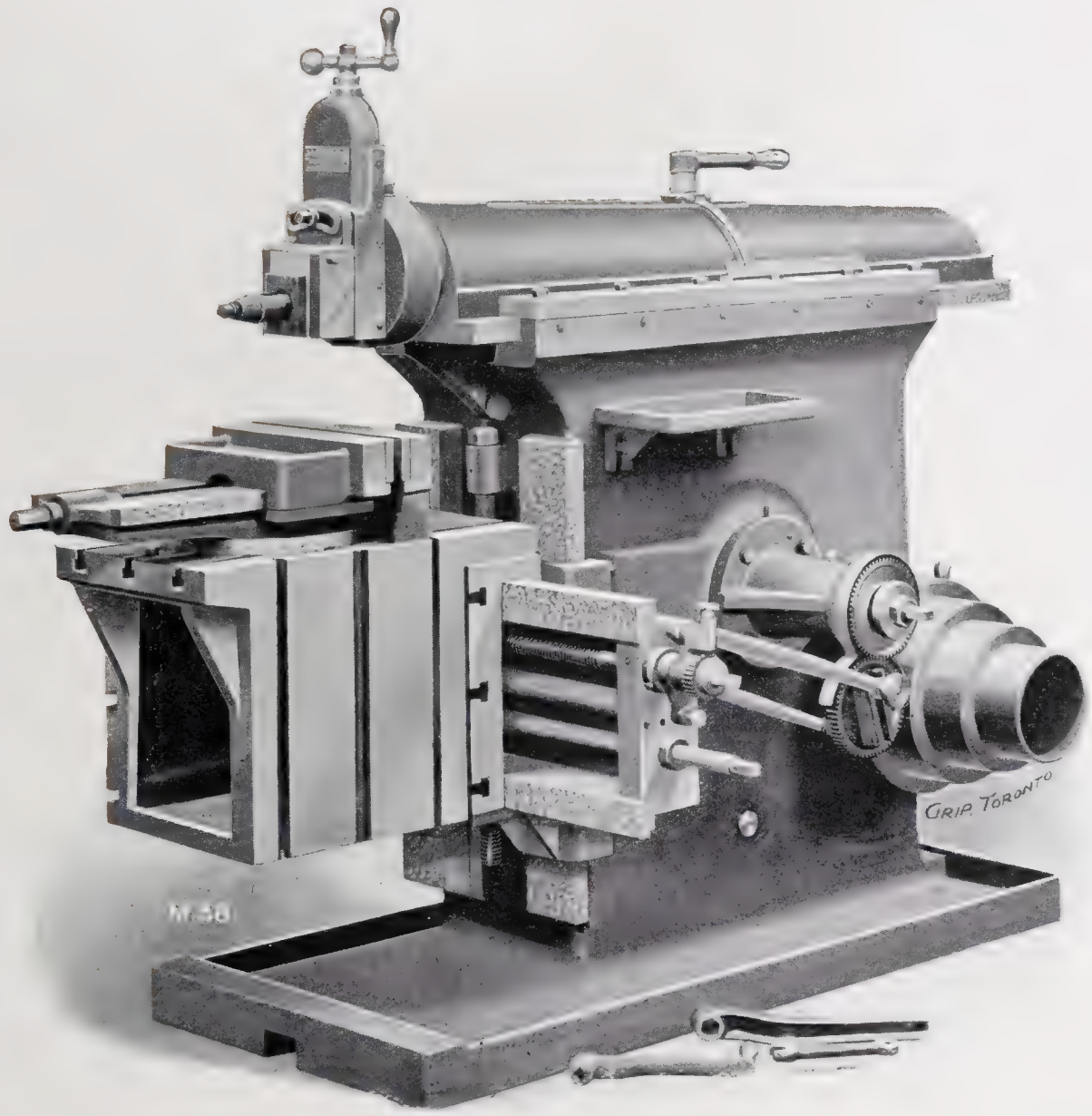
SHAPING MACHINES

THESE Shapers are designed for the finest tool and die work as well as ordinary shop use. All adjustments are made quickly from one side of the machine, and the screw which elevates the knee is provided with ball-thrust bearings, making it easy to adjust. The table has variable power-feeds in both directions, and is of box form with three available working sides. Machines are driven from a four-step cone for wide belt supported by an outer bearing.

Special consideration has been given to the construction of the base so as to afford additional rigidity to the machine, and it is of sufficient length to enable the entire width of table to rest on the projecting portion by means of an outer bearing.

DIMENSIONS

Size of Machine	Maximum Stroke of Cutter-Bar	Vertical Adjustment of Table	Traverse of Table	Size of Table	Countershaft-Pulleys		Code-Word
					Dimensions	Revolutions	
Inches	Inches	Inches	Inches	Inches	Inches	Inches	
16	16½	14	21	16 x 11 x 13½	14 x 3½	250	HIRTIANIOR
20	20½	20	20	20 x 13 x 15¼	12 x 3¼	180	HIRTIORA
24	24½	15½	27	24 x 14 x 16¾	16 x 4	200	HIRTIUS

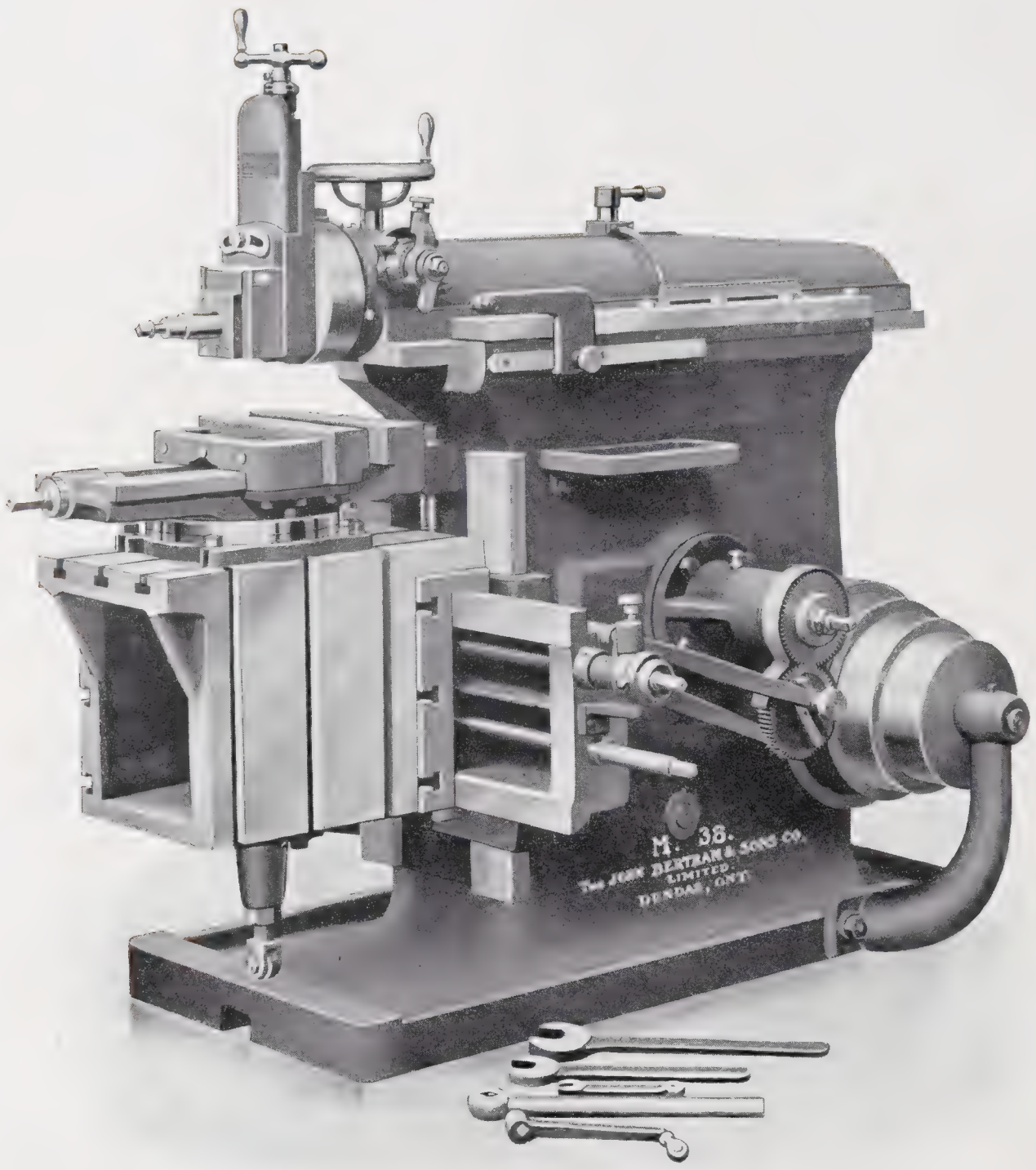


16-INCH SHAPING MACHINE

No. M-37

MAXIMUM stroke, 16½ inches. Vertical adjustment of table, 13 inches. Traverse of table, 21 inches. The swivelling-head has a vertical movement of 6 inches. The countershaft pulleys are 14 inches in diameter for 3-inch belt and should make 250 revolutions per minute.

Code-Word — HIRTIANIOR



24-INCH SHAPING MACHINE

No. M-38

MAXIMUM stroke, 24½ inches. Vertical adjustment of table, 15½ inches. Transverse of table, 27 inches. The swivelling-head has a vertical movement of 7 inches. The countershaft pulleys are 16 inches in diameter for 3½-inch belt and should make 200 revolutions per minute.

Code-Word . . . . . HIRTIUS
Code-Word, for swivel-vise . . . . . HIRSCHKOTH
Code-Word, with swivel-vise and power down-feed to head . . . . . HIRTLOS

TRAVELLING-HEAD SHAPING MACHINES

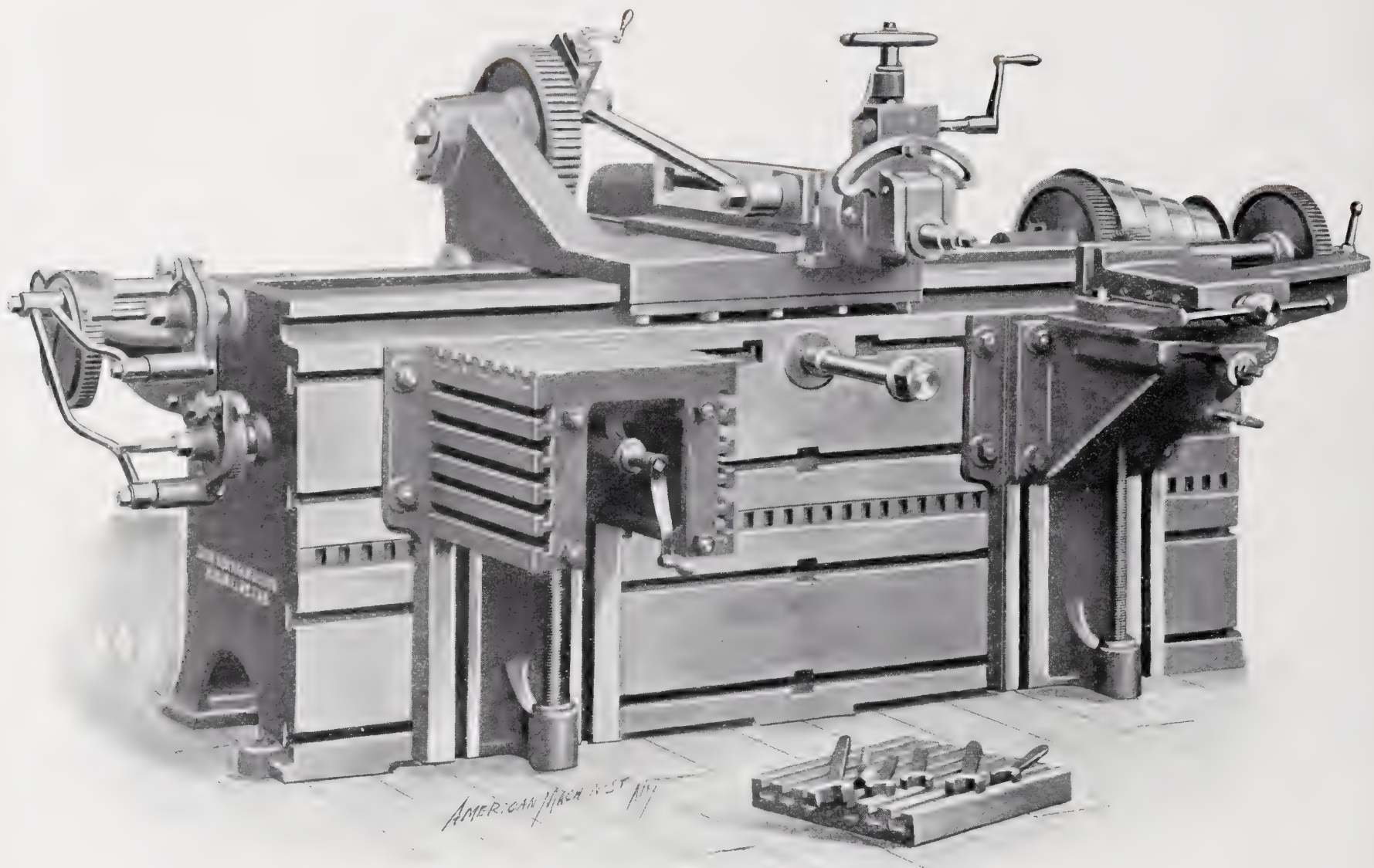
THESE machines may be furnished with varied lengths of bed having one or two heads as desired. Saddles have variable power-feeds along the beds in either direction and rapid hand-movement by rack and pinion. The cutter-bars have quick return and adjustment for any length or position of stroke. The tool-slides swivel to any angle and may be provided with power feed if so ordered.

Two tables are furnished, one with the top and both sides "T" slotted, and the other in the form of a knee for holding the vise or supplementary revolving "T" slotted table. The tables are adjustable horizontally on the bed by rack and pinion, and vertically by screws which are hung in ball bearings. The cutter-bars have eight changes of speed through four-step cone with back gear.

Swivel-vise, index-centers, cone-arbor attachment with power rotary-feed in either direction, and countershaft are furnished with each machine.

DIMENSIONS

Size	Maximum Stroke	Vertical Adjustment of Tool	Usual Length of Bed with One Head	Saddle Traverse with One Head	Usual Length of Bed with Two Heads	Countershaft Pulleys		Code-Words With Attachments	
						Dimensions	Revolutions	One Head	Two Heads
Inches	Inches	Inches	Ft. & In.	Ft. & In.	Feet	Inches			
12	12	6	5	3—6	8	14 x 4½	120	HIRTENGRAS	HIRTENHAUS
16	16	6	6—6	4—5	9	16 x 4½	120	HIRTENHUT	HIRTENKOST
18	19	7	8	5—6	12	18 x 5½	225	HIRTENRING	HIRTENTHAL
24	25	8	10	7	14	15 x 5	280	HIRTEZA	HIRTIA



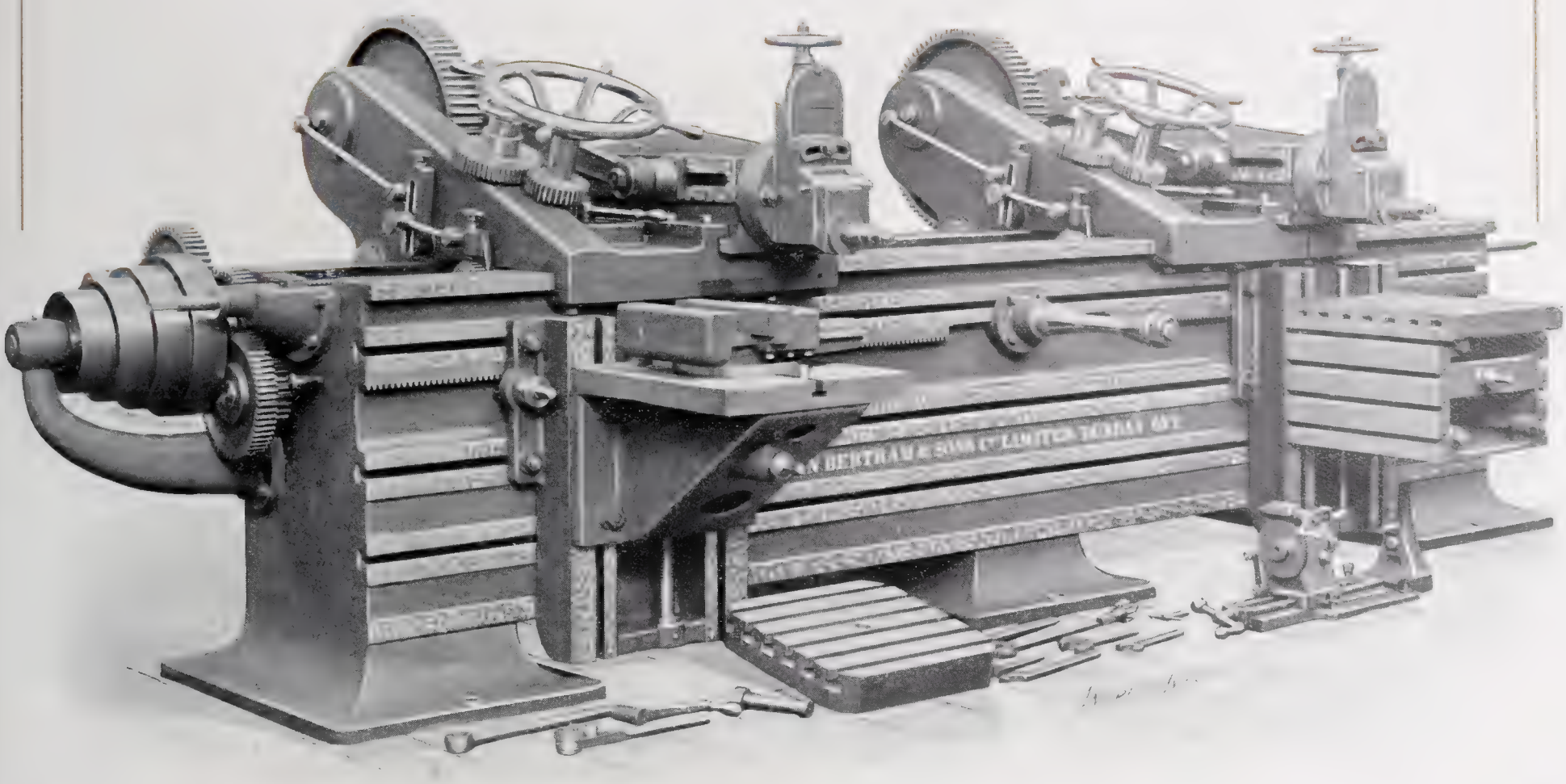
18-INCH TRAVELLING-HEAD SHAPING MACHINE

No. M-42

MAXIMUM stroke, 19 inches. Vertical travel of tool-slide 7 inches. Traverse of the saddle with bed 8 feet long, 5 feet 6 inches. The extreme distance between tables is 50 inches, which are adjustable vertically and horizontally. The machine, as illustrated, is provided with swivel-vise, index-centers and cone-arbor, having power rotary-feed.

The countershaft pulleys are 18 inches in diameter for 5-inch belt, and should make 225 revolutions per minute.

Code-Word, one head, with swivel-vise, cone-arbor and index-centers . . . . . HIRTENRING
Code-Word, two heads, with swivel-vise, cone-arbor and index-centers . . . . . HIRTENTHAL



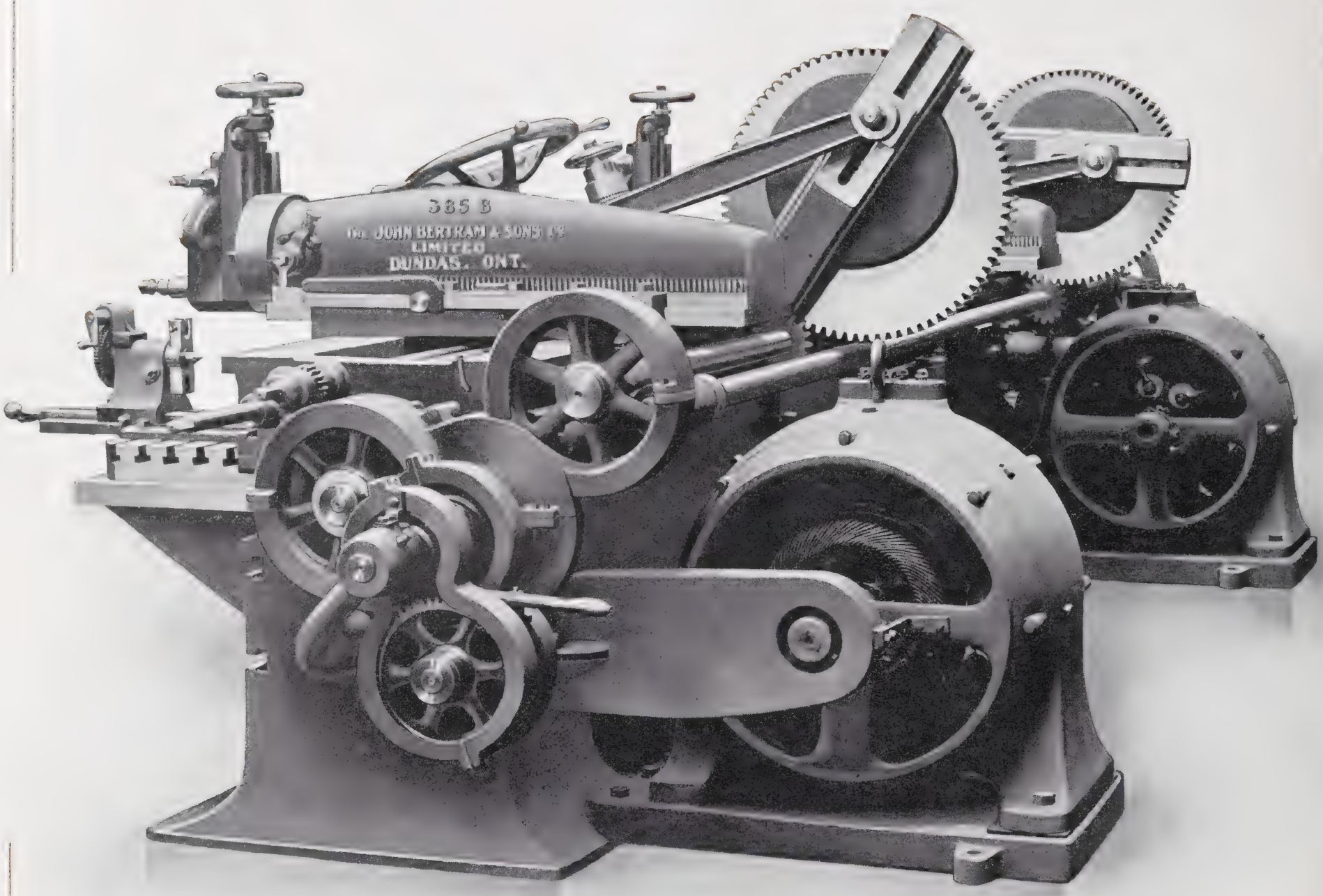
24-INCH DOUBLE TRAVELLING-HEAD SHAPING MACHINE

No. M-385

MAXIMUM stroke, 25 inches. Vertical travel of tool-slide, 8 inches. Traverse of the saddles with bed 14 feet long, 8 feet 6 inches. The tables are adjustable vertically and horizontally. The machine, as illustrated, is provided with swivel-vise, index-centers and cone-arbor, having power rotary-feed.

The countershaft pulleys are 15 inches in diameter for 4½-inch belt, and should make 280 revolutions per minute.

Code-Word, one head, with swivel-vise, cone-arbor and index-centers	[illegible]
Code-Word, two heads, with swivel-vise, cone-arbor and index-centers	HIRTIA
Code-Word, for direct-connected motor	ICEBERG



24-INCH DOUBLE TRAVELLING-HEAD SHAPING MACHINE

MOTOR DRIVEN

No. M-385 B

MAXIMUM stroke, 25 inches. Maximum distance between cutting-tools with 14-foot bed, 11 feet 6 inches, and minimum distance, 34 inches. The saddles have variable power-feed along the bed in either direction and rapid hand-movement by rack and pinion. The cutter-bars have Whitworth quick return and adjustment for any length or position of stroke.

Code-Word, one head, with swivel-vise, cone-arbor and index-centers .	. HIRTEZA
Code-Word, two heads, with swivel-vise, cone-arbor and index-centers.	. HIRTIA
Code-Word, for direct-connected motor.	ICEBERG

SLOTTING MACHINES

SLOTTING MACHINES

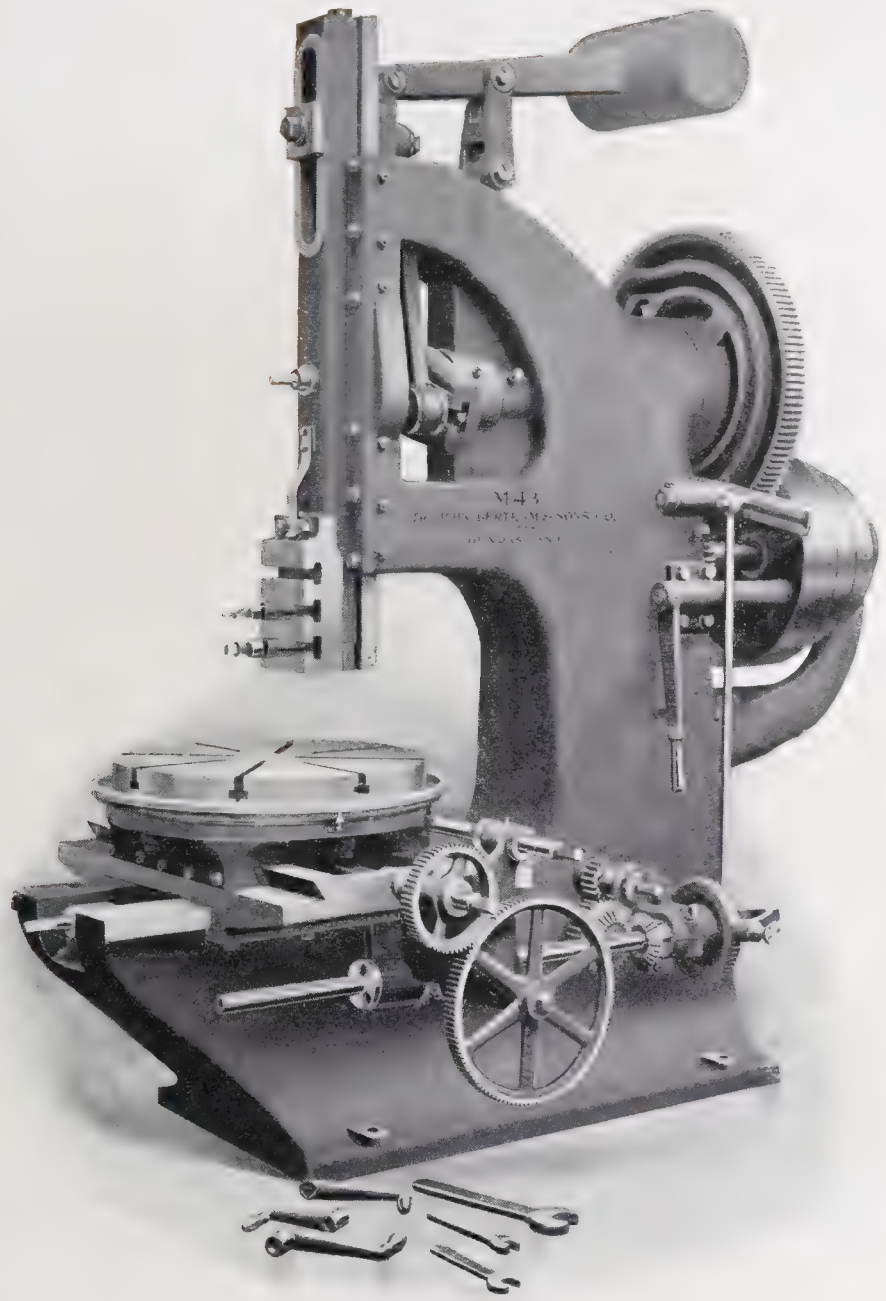
On the following pages is illustrated a line of Crank Slotting Machines, which are built in various sizes, with stroke from 8 to 24 inches.

The cutter-bars are adjustable for any length or position of stroke, are counterweighted and have quick return. All sizes are provided with a relief tool-apron. On the larger machines long adjustable guides, which may be set close to the work, reinforce the cutter-bar.

The machines are provided with circular tables which have power rotary and longitudinal feeds.

DIMENSIONS

Size	Maximum Stroke	Distance Front of Tool-Apron to Column	Height Between Table and Frame	Diameter of Table Working Surface	Table Traverse		Countershaft-Pulleys		Code-Word
					Longitudinal	Transverse	Dimensions	Revolutions	
Inches	Inches	Inches	Inches	Inches	Inches	Inches	Inches		
[illegible]	9	[illegible]	[illegible]	24	20	16	18 x 9	235 & 280	HOLOTOME
10	11	23	[illegible]	26	24	18	20 x 9	120 & 165	HOLOTRICHA
12	13	27	17	[illegible]	30	24	20 x 9	132 & 198	HOLOVERA
14	15	[illegible]	20	34	36	28	24 x 10	104 & 156	HOLPEN
16	17½	32	[illegible]	[illegible]	[illegible]	30	24 x 11	96 & 144	HOLPERTE
18	19	31½	23	42	40	32	24 x 11	96 & 144	HOLSTER
20	21	43	27	42	40	32	24 x 15	110 & 115	HOLUNDER
24	25	43	[illegible]	52	50	40	30 x 15	120 & 130	HOLWIT

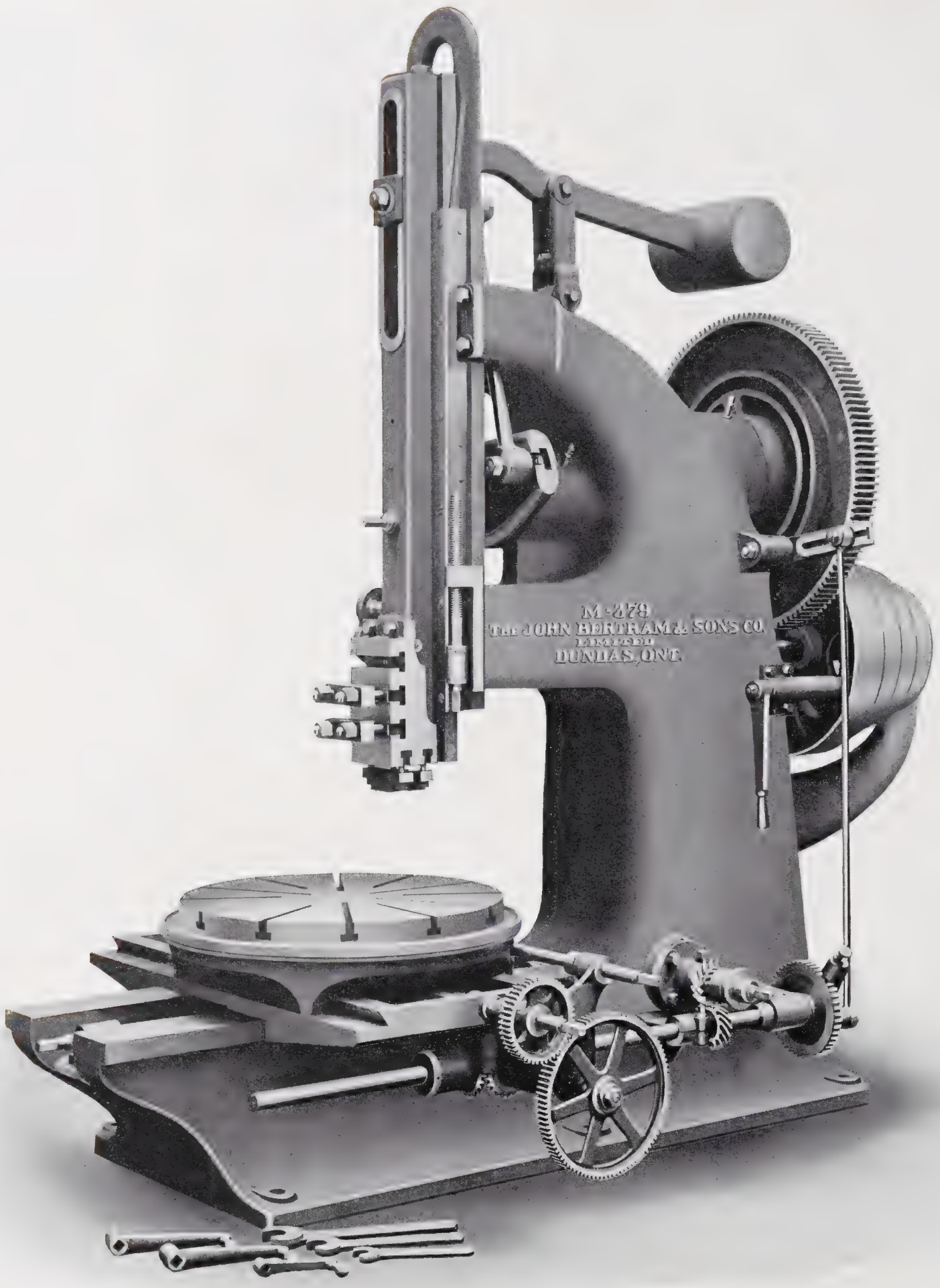


8-INCH SLOTTING MACHINE

No. M-43

MAXIMUM stroke, 9 inches. Distance from tool-apron to column, 24 inches. Height between table and frame, 13½ inches. The table is 24 inches in diameter on its working surface, and has a longitudinal travel of 20 inches and a cross traverse of 16 inches. The cutter-bar is provided with spring relief tool-apron, having both vertical and horizontal clamping surface.

Code-Word . . . . . HOLOTOME

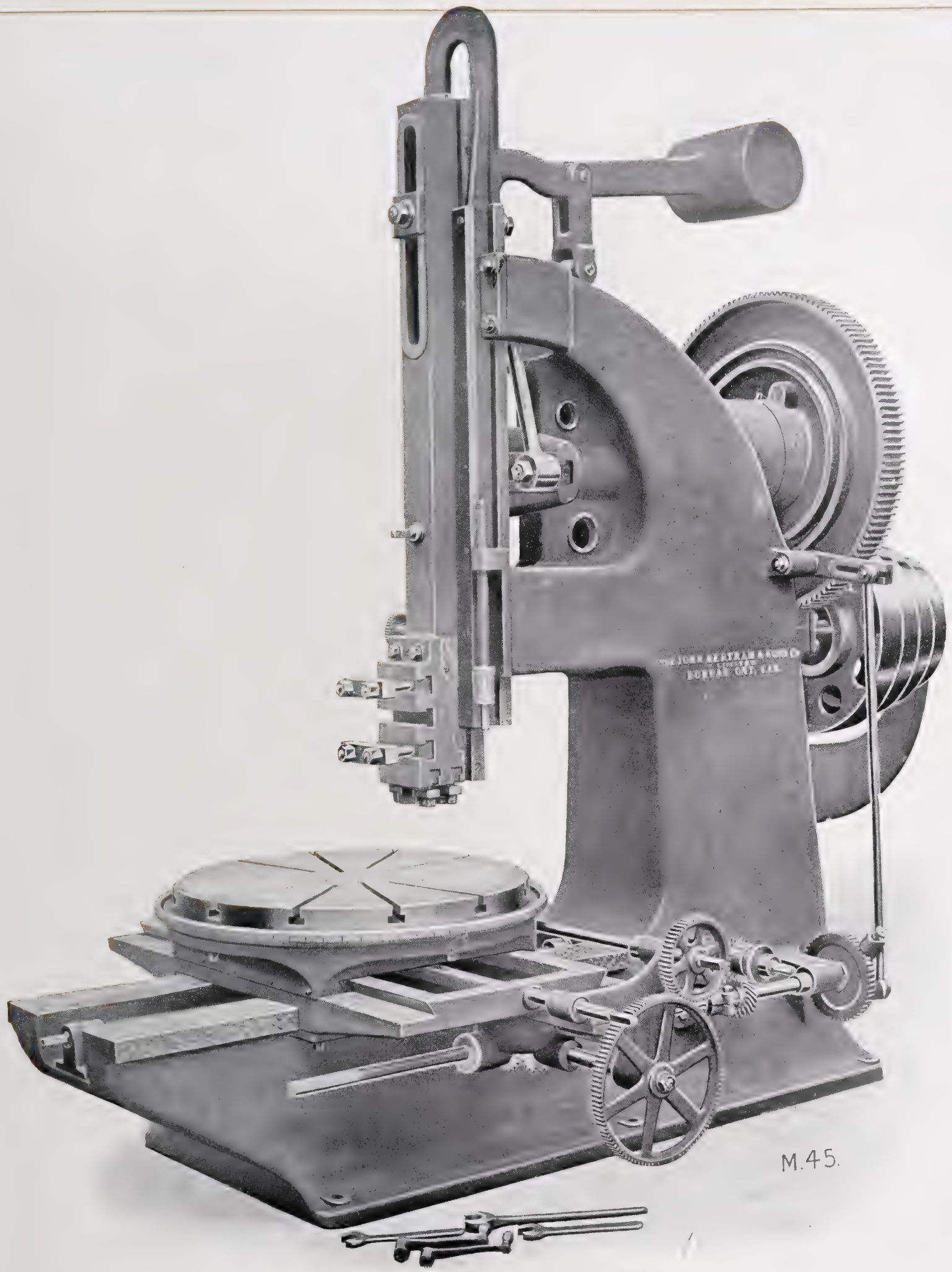


14-INCH SLOTTING MACHINE

No. M-379

MAXIMUM stroke, 15 inches. Distance from tool-apron to column, 30 inches. Height between table and frame, 20 inches. The table is 34 inches in diameter on its working surface, and has a longitudinal travel of 36 inches and and a cross traverse of 28 inches. The cutter-bar is provided with automatic relief tool-apron, having both vertical and horizontal clamping surface.

Code-Word . . . . . HOLPEN



16-INCH SLOTTING MACHINE

No. M-45

MAXIMUM stroke, 17½ inches. Distance from tool-apron to column, 32 inches. Height between table and frame, 21½ inches. The table is 42 inches in diameter on its working surface, and has a longitudinal travel of 38 inches, and a cross traverse of 30 inches. The cutter-bar is provided with automatic relief tool-apron, having both vertical and horizontal clamping surface.

Code-Word, belt driven . . . . ICEBERG
Code-Word, for direct-connected motor

HORIZONTAL BORING AND DRILLING MACHINES

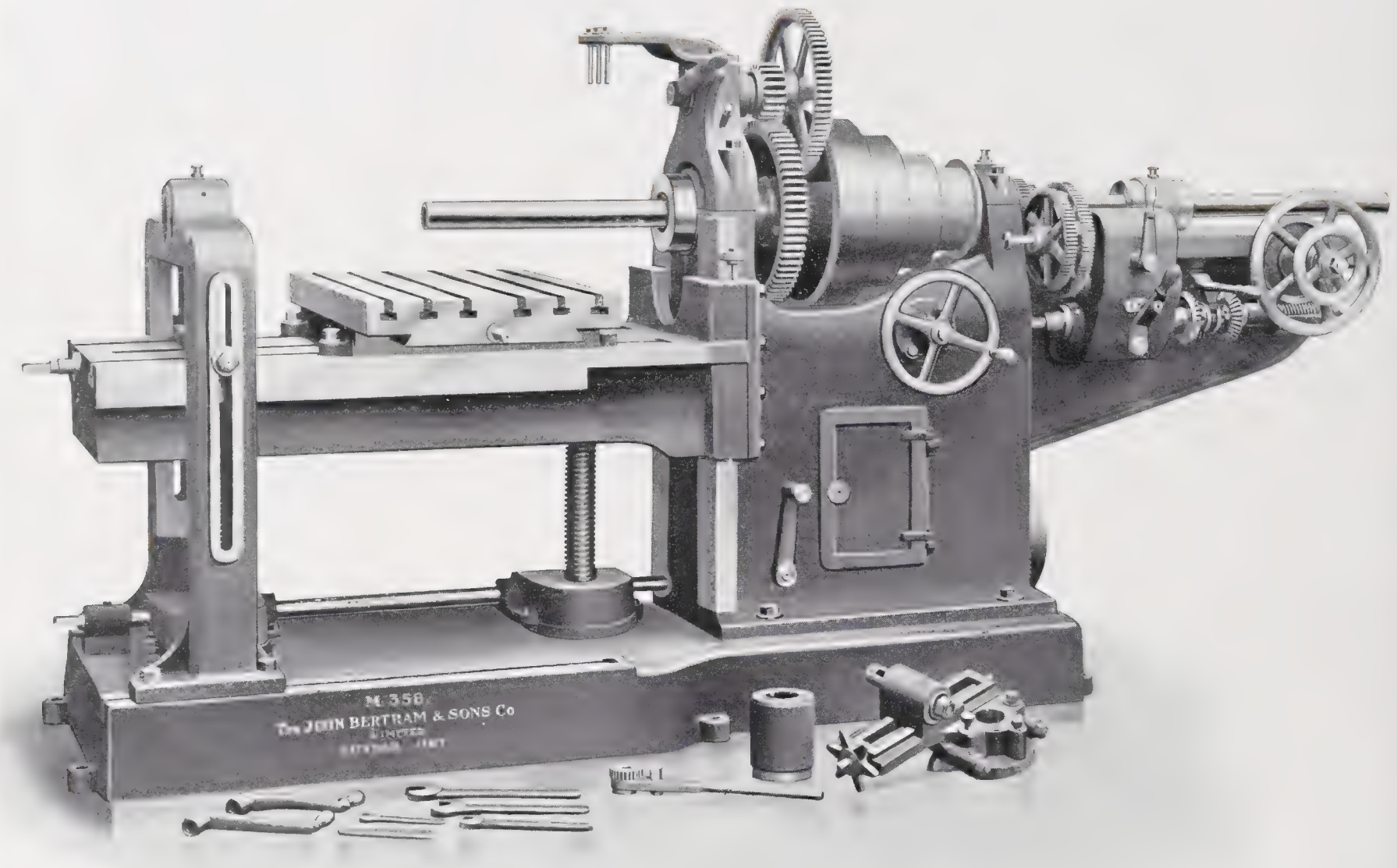
HORIZONTAL BORING AND DRILLING MACHINES

THE facility with which the work may be clamped to the table of the Horizontal Boring and Drilling Machine makes this type of machine particularly applicable to work where there are a number of parallel holes to be drilled or bored, as they can be finished at one setting.

The spindles of these machines have automatic reversible boring and drilling feeds and rapid-hand movement in either direction. The main tables are supported on two large screws raised and lowered by power, except in the case of the smallest machines, where the motion is by hand only. The cross-tables are usually furnished with hand cross and longitudinal feeds, but power-feed may be provided if ordered. Extra round table, with or without power rotary motion, may be fitted to the cross-table. The yoke supporting the outer end of boring-bar is adjustable along the bed, power being provided for this purpose on all large sized machines. One facing-head, fitted to the spindle, carrying adjustable tool-holder for facing, is provided. Machines can be operated from either side, and are in all respects quickly and easily handled.

DIMENSIONS

No. of Machine	SPINDLE			Greatest Distance Center of Spindle to Main Table	Length of Main Table	Greatest Distance from Spindle to Yoke	Countershaft-Pulleys		Code-Word
	Diameter	No. of Speeds	Traverse				Diameter	Revolutions	
	Inches		Inches	Inches	Ft. & In.	Inches	Inches		
1	2—11/16	8	40	26	4—6	44	15 x 5	120	FUPPEN
2	3—⅞	8	54	31	6	64	20 x 5½	100	FURACAD
3	4—½	8	72	36	8	84	24 x 6	90	FURACES



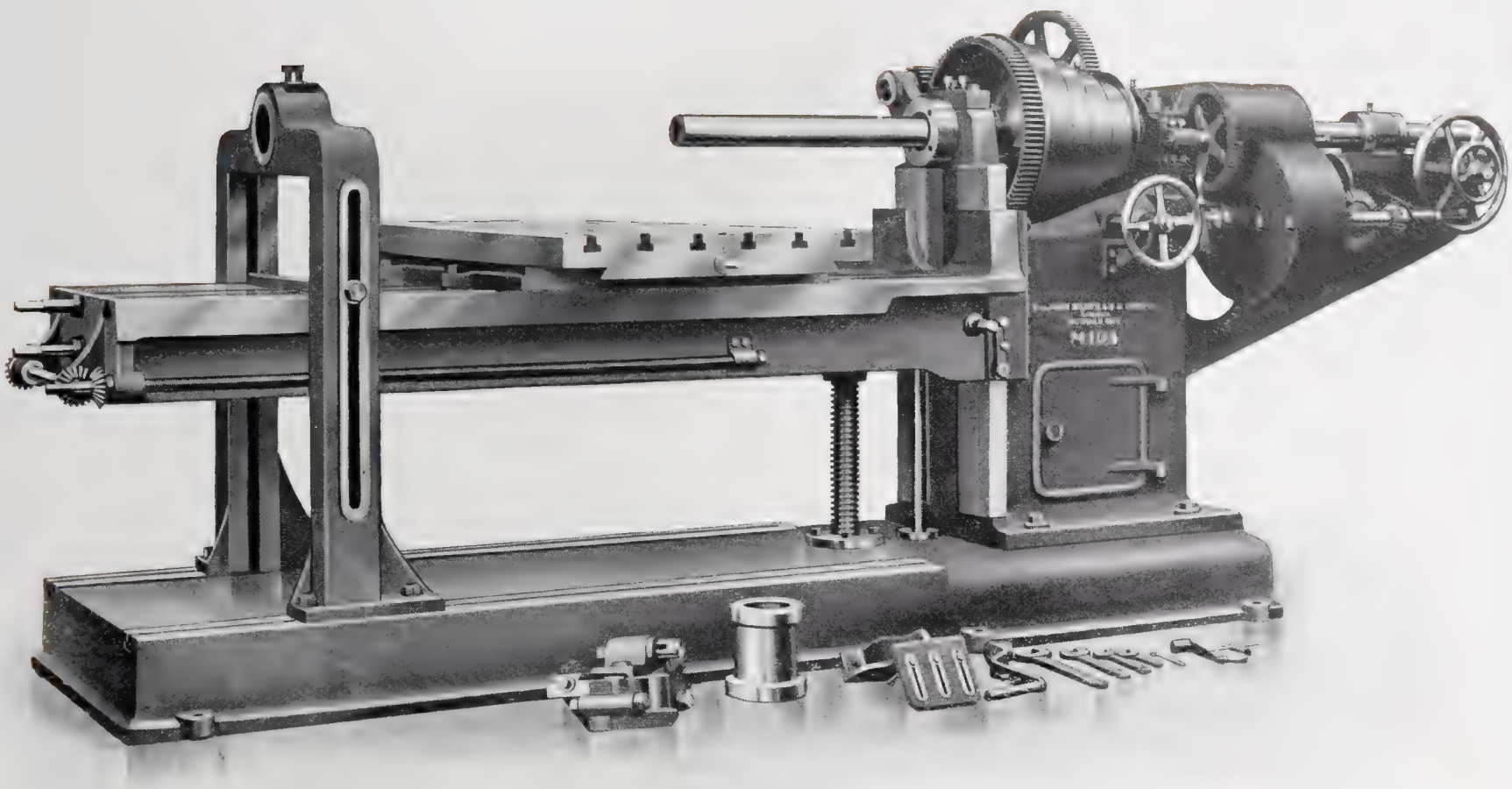
No. 1 HORIZONTAL BORING AND DRILLING MACHINE

No. M-358

THE spindle, which is 2-11/16 inches in diameter, has a total traverse of 40 inches, eight changes of speed, and eight changes of power feed. Greatest distance from center of spindle to main table, 26 inches; to cross table, 21 inches. The main table is 4 feet 6 inches or 6 feet 6 inches long, as may be ordered.

The length of spindle may be varied to suit special requirements.

Code-Word, with 4-foot 6-inch table . . . . . FUPPEN
Code-Word, with 6-foot 6-inch table . . . . . FURABARIS



HORIZONTAL BORING AND DRILLING MACHINE

No. M-104

THE spindle is 4½ inches in diameter and has a total traverse of 72 inches, eight changes of speed, and four changes of power-feed. Greatest distance from center of spindle to main table, 36 inches; to cross table, 28 inches. The main table is regularly built 8 feet long, but this length may be increased if desired. The length of the spindle may be varied to suit special requirements.

Code-Word, with 8-foot table, belt driven . . . . . FURACES
Code-Word, for direct-connected motor . . . . . ICEBERG

TWO-SPINDLE HORIZONTAL BORING MACHINE

No. M-560

THE spindles are steel, run in bronze bearings, and are 14 inches between centers. Height from top of table to center of spindles, 10¼ inches. The greatest distance between the spindle bearing and outer support is 5 feet 4 inches. The outer bearing is movable along the bed and fitted with adjustable bushes to suit boring-bars. The cross-table has a working surface of 26 x 48 inches, and has three changes of power longitudinal feed by cone-gearing, controlled by hand-lever at the front. Countershaft pulleys are 24 inches in diameter for 6-inch belt and should make 60 revolutions per minute.

Code-Word . . . . . FULLORBED

THE JOHN BERTRAM & SONS COMPANY, LIMITED

BORING AND TURNING MILLS

BORING AND TURNING MILLS

ON the following pages we illustrate a line of Vertical Boring and Turning Mills suitable for both light and heavy work. The utility of machines of this type, possessing certain advantages, has given them a permanent position in the engineering shops in this country. The weight of the revolving table carrying the work is distributed over a large annular bearing, creating a favorable condition for more permanent stability than obtained in a lathe, where the work attached to the face-plate overhangs the front bearing, and depends on the stiffness of the spindle for the character of its support.

The two independent adjustable heads of the Boring and Turning Mill are another point of its superiority over the lathe, as both heads may be used on work at the same time.

The beds are all cast in one piece (up to the limit of shipping size), and are of deep, heavy box section with ample bracing. The tables are of deep section and thoroughly braced, having large "T" slots for securing the work. The spindles have large bearings adjustable for wear. The upper bearing is mounted in the bed and the lower bearing is carried on a heavy casting securely bolted to the bed in which is inserted a steel step which receives the end-thrust of spindle. For light work and high rotative speeds the spindle-step may be raised, thus lifting the table from the annular bearing and reducing the friction. The cross-rails are of heavy box-girder section and are provided with power elevating gear. The tool-bars swivel, and on the large mills are adjusted by means of worms to any angle. The saddles carrying the tool-bars are independent in their movements and may be fed in the same or opposite directions.

Vertical Boring and Turning Mills may be provided with the following attachments: Independently-driven boring-bar designed for boring in the center or at any radius within the capacity of the machine; slotting attachment; thread-cutting attachment; turret-head mounted on a slide having vertical travel on the saddle; independent chuck-jaws and universal chuck-jaws.

Mills with extension housings can be furnished as shown by the illustrations. They are similar in design to the standard machines. The housings are arranged to move back and forth by power. For boring work when the housings are drawn back an extension saddle mounted on the crossrail is provided. This saddle is fitted with a boring-bar having power-feed and rapid hand-traverse.

DIMENSIONS

STANDARD BORING AND TURNING MILLS

Swing	Height under Tools	Travel of Bars	Diameter of Table	Countershaft-Pulleys			Code-Word
				Diameter	Face	Revolutions	
	Inches	Inches	Inches	Inches	Inches		
37-Inch	24	18	35	18	11	169 & 189	GAINSTOOD
42-Inch	26	19	37	[illegible]	11	169 & 189	GAINULES
48-Inch	32	24	46	20	12	220 & 285	GAIOLA
60-Inch	40	[illegible]	57	18	12	154 & 187	GAIPEIRO
6-Foot	44	36	64	18	12	169 & 137	GAIRFOWL
7-Foot	48	39	76	24	13	124 & 154	GAIRISH
8-Foot	54	39	84	27	6	160	GAIRISHLY
10-Foot	66	42	100	27	6	[illegible]	GAISSENIE
12-Foot	80	48	120	30	7	154	GAISSIN
14-Foot	96	54	144	36	8	175	GAITADA

EXTENSION BORING AND TURNING MILLS
(WITH BORING REACH)

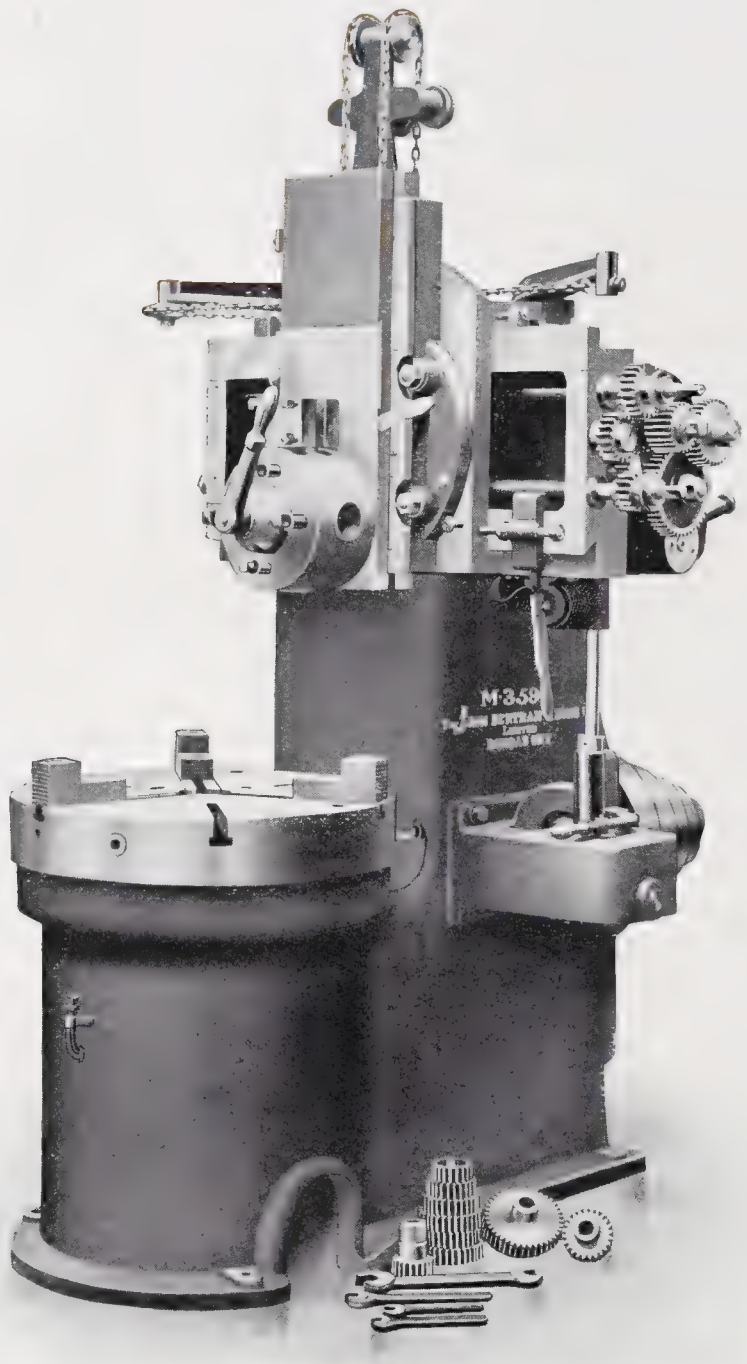
7-10-Foot	48	39	78	24	7	124 & 154	GAITAMA
10-16-Foot	66	36	100	28	7	165	GAITANO
12-18-Foot	80	42	120	36	7	154	GAITEANDA
14-20-Foot	96	44	144	36	8	175	GAITEAVA

EXTRA HEAVY BORING AND TURNING MILLS
(FOR TIRE WORK)

50-Inch	33	32	49¾	24	8	260	[illegible]
7-Foot	53	48	84	[illegible]	8	248 & 295	GALEFFO

TURRET BORING AND TURNING MILLS

30-Inch	16	18	29	14	9	157 & 196	GAINSTERS

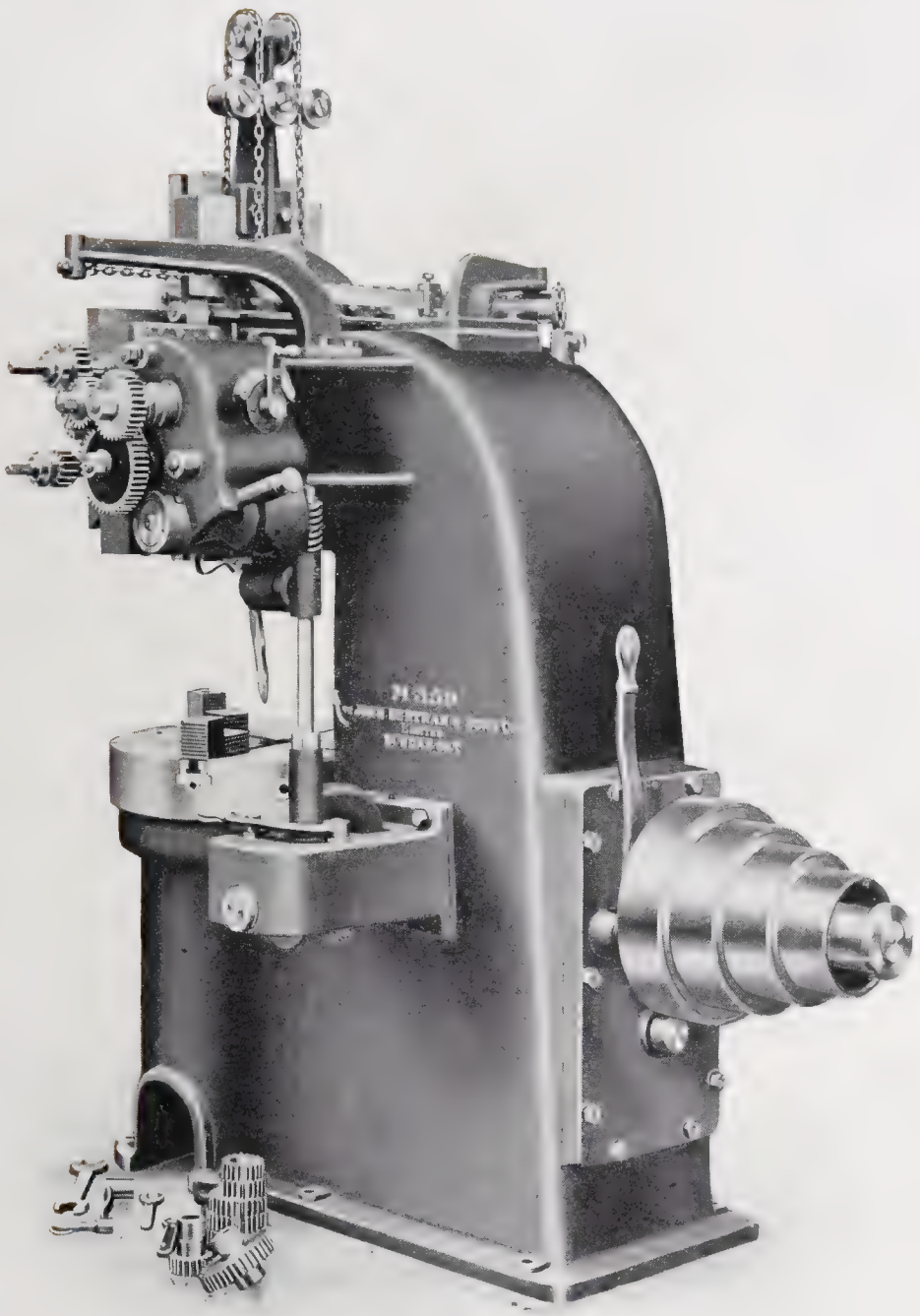


30-INCH TURRET BORING AND TURNING MILL

No. M-359

THIS machine is designed for boring and turning, the turret-slide having power cross-feed. The table is fitted with three chuck-jaws for work from 4 to 28 inches in diameter, and has sixteen changes of speed. The turret-slide has a vertical traverse of 18 inches, and a cross traverse of 18 inches. The countershaft has pulleys 14 inches in diameter for 4-inch belt, and should make 157 and 196 revolutions per minute

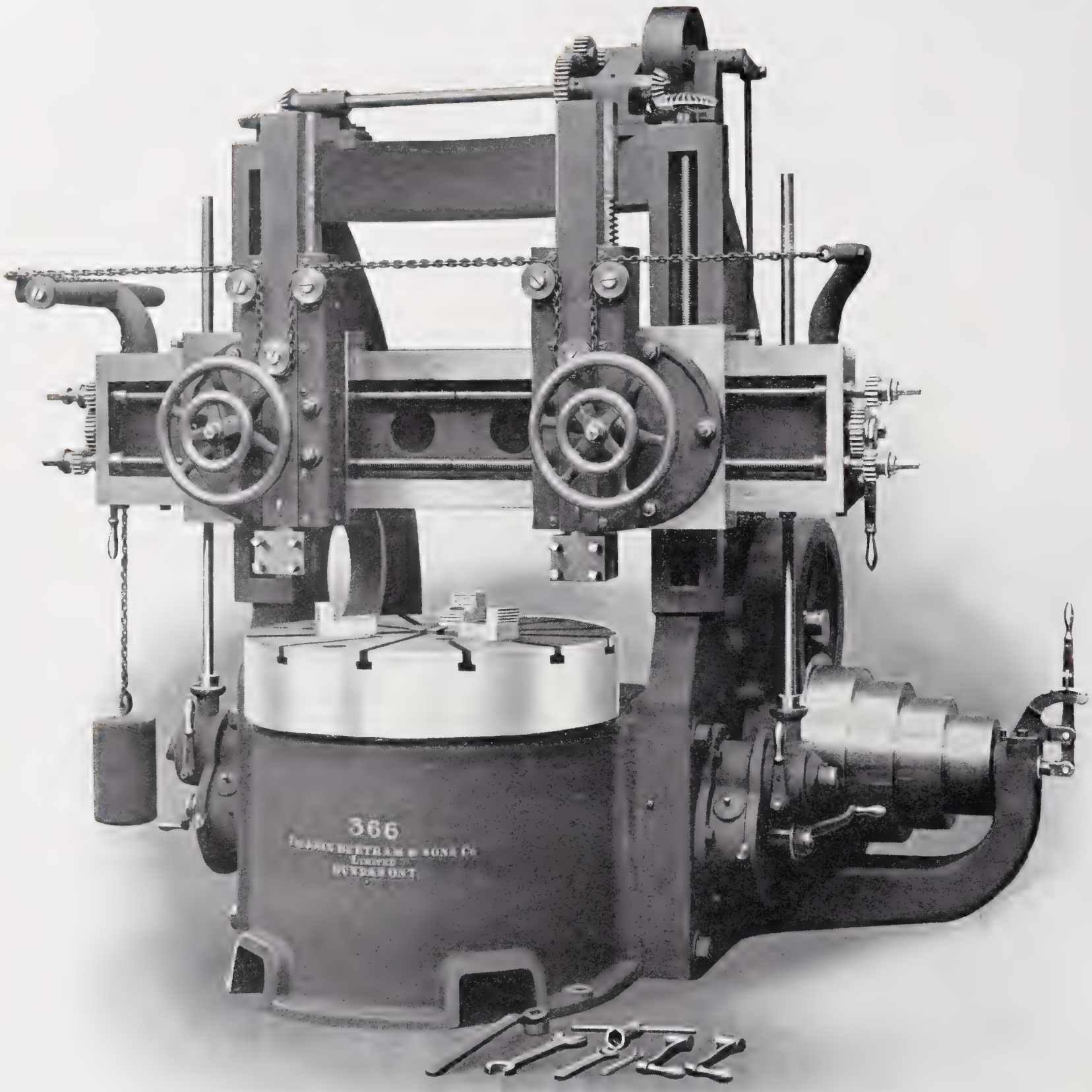
Code-Word . . . . . GAINSTERS
Code-Word, for universal chuck-jaws . . . . . GALAHAT



30-INCH TURRET BORING AND TURNING MILL

No. M-359

THIS machine is designed for boring and turning, the turret-slide having power cross-feed. The universal chuck has three jaws built into the table. The chuck-jaws can be easily removed and independent jaws used when desired. The turret-slide has a vertical travel of 18 inches and cross traverse of 18 inches. Distance from top of table to rail is 16 inches. The table has sixteen changes of speed through back-gear and two-speed countershaft.



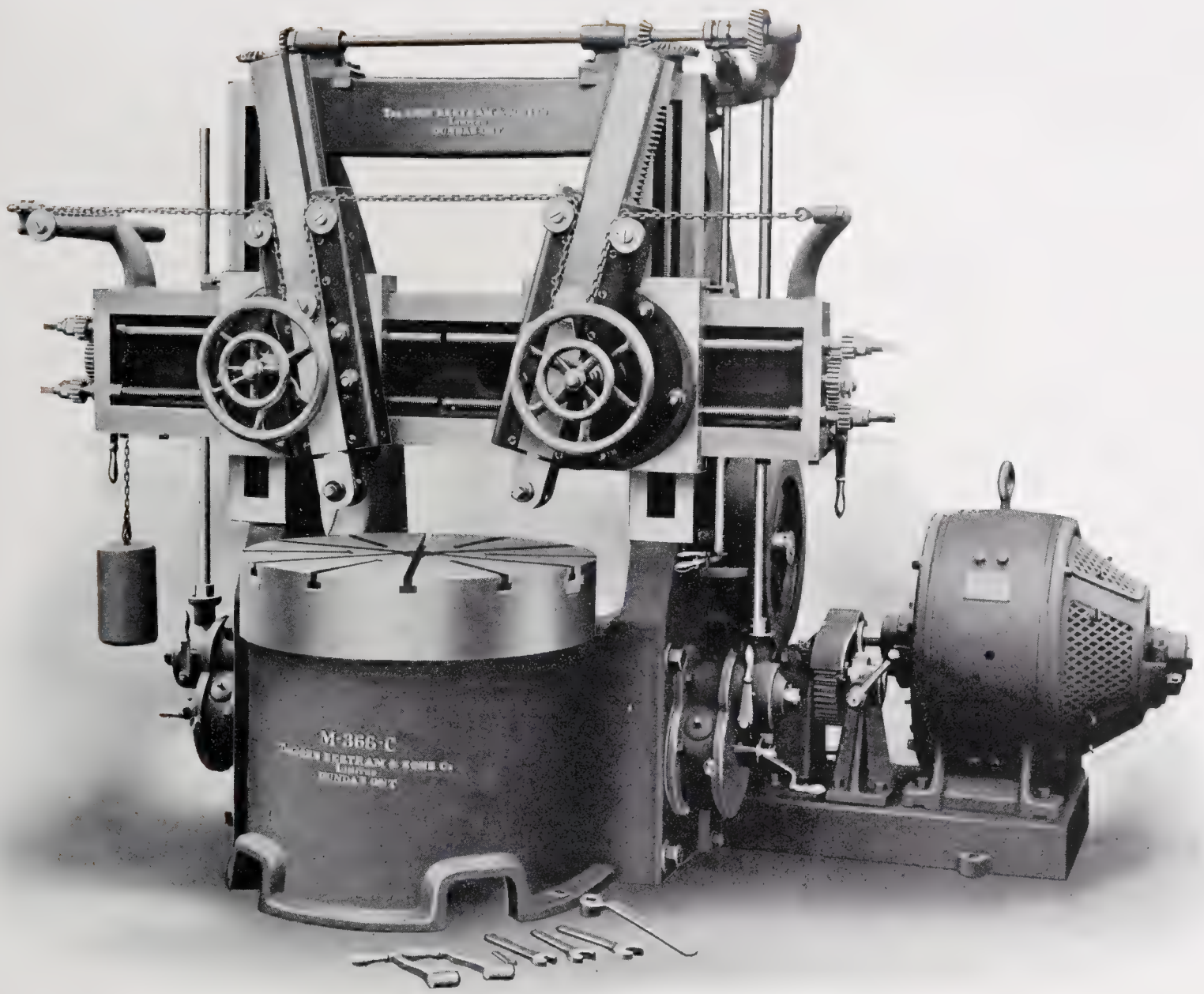
37-INCH BORING AND TURNING MILL

WITH CHUCK TABLE

No. M-366

SWINGS 37 inches in diameter. Greatest height under tools, 24 inches. The feeds are positive and have eight changes. The heads are independent in all their movements, both as to direction and amount of feed. The table of the machine illustrated is fitted with independent chuck-jaws.

Code-Word. . . . . GAINSTOOD
Code-Word, for independent chuck-jaws. . . . . GALADAGEN

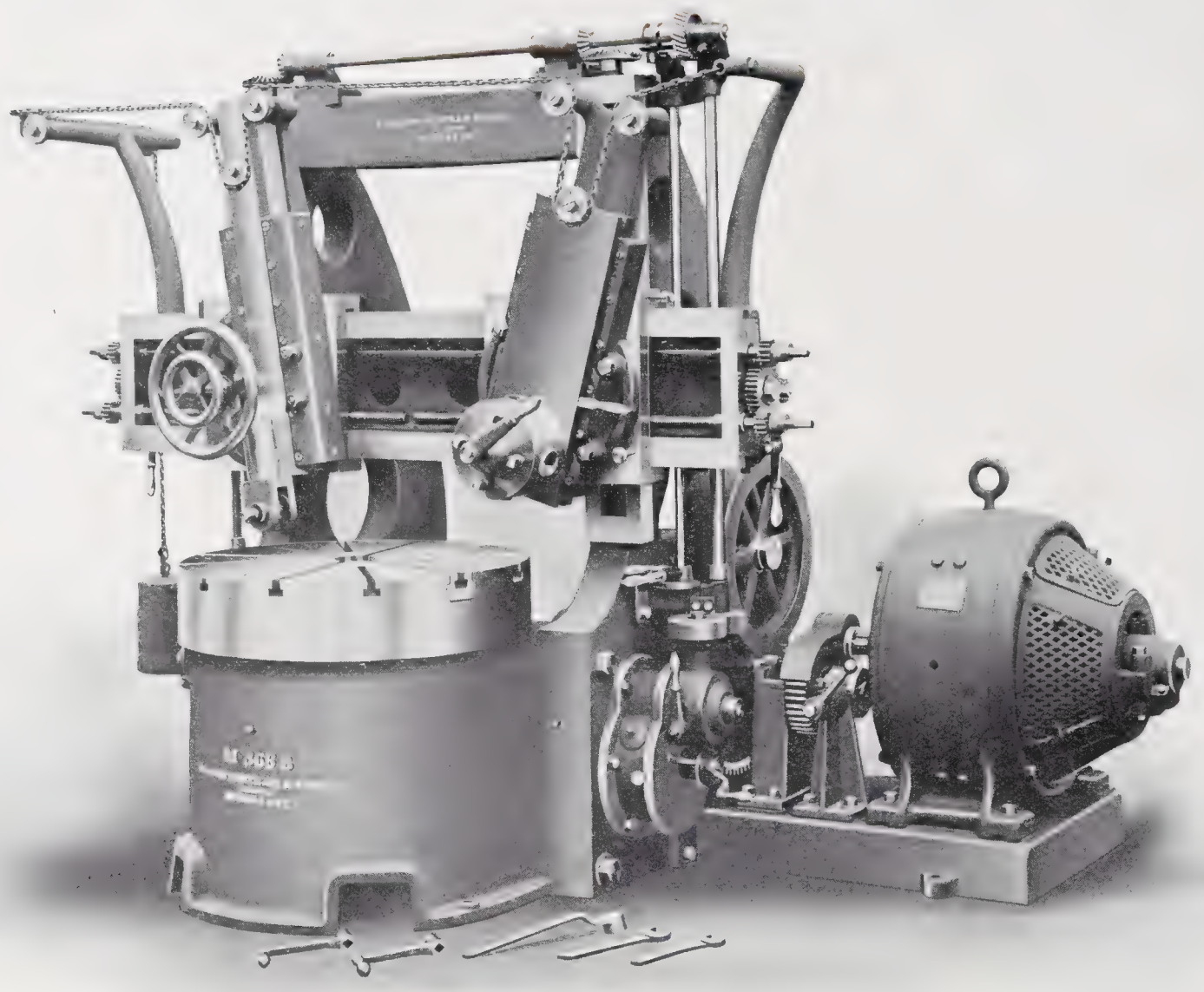


37-INCH BORING AND TURNING MILL

No. M-366 C

SWINGS 37 inches in diameter. Greatest height under tools, 24 inches. The heads have independent feeds, and either can be brought to the center for boring. The machine is driven by a variable speed-motor. The range of speeds through motor and gearing is sufficient to give a cutting speed of 25 feet at 38 inches diameter.

Code-Word . . . . . .
Code-Word, for universal chuck-jaws .
Code-Word, for direct-connected motor



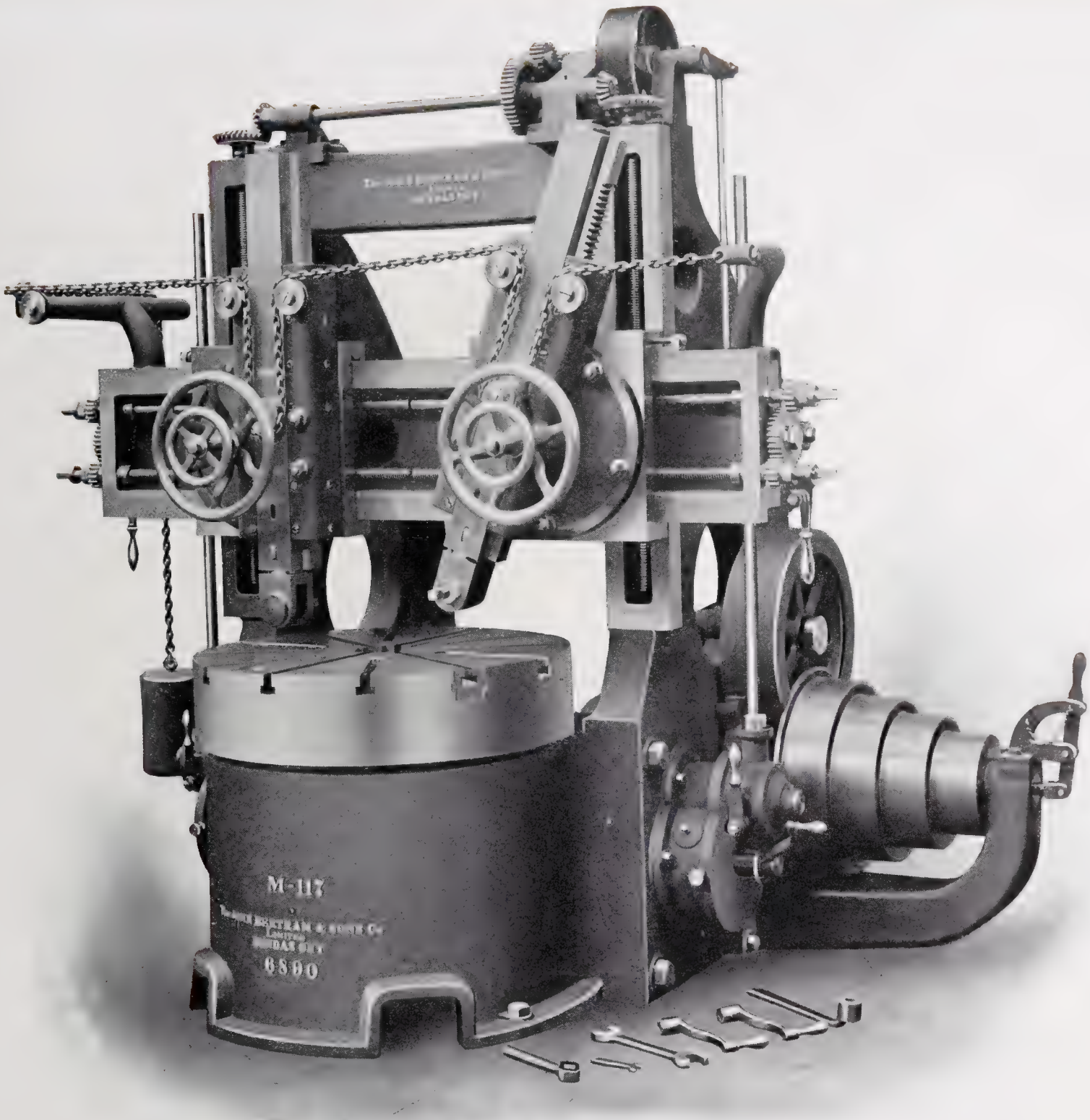
37-INCH BORING AND TURNING MILL

WITH TURRET HEAD

No. M-366 B

SWINGS 37 inches in diameter. Greatest height under tools, 24 inches. The mill is provided with a turret, which is mounted on a slide having a vertical travel on the saddle of 16 inches, and can be set to turn and bore at any angle. The heads are independent in their movements, both as to direction and amount of feed.

Code-Word	GAINSTOOD
Code-Word, for one regular and one turret head	GALANASD
Code-Word, for universal chuck-jaws	GALAHAT
Code-Word, for direct-connected motor	ICEBERG



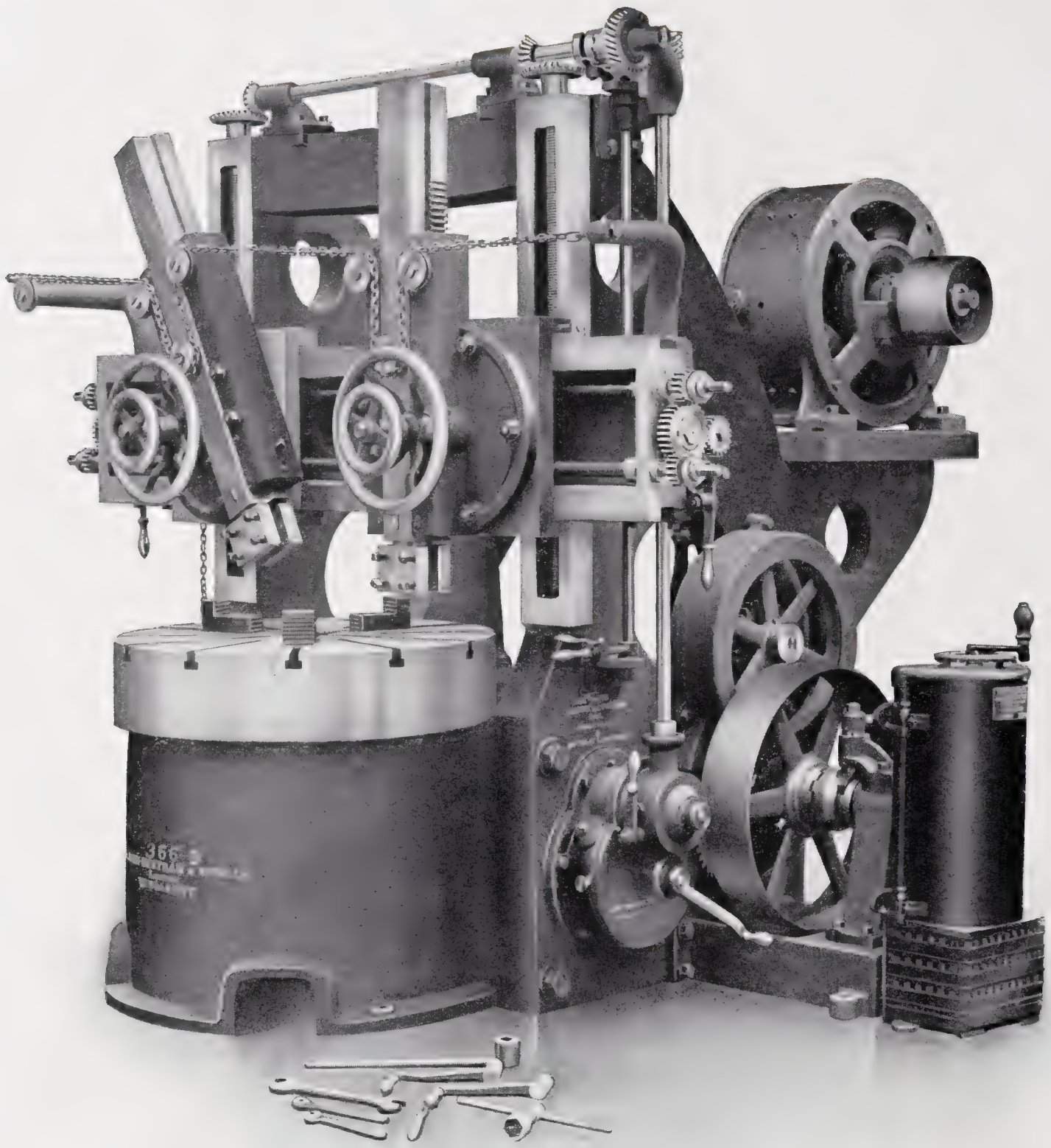
42-INCH BORING AND TURNING MILL

WITH TWO REGULAR TURNING HEADS

No. M-117

SWINGS 42 inches in diameter. Greatest height under tools, 26 inches. The feeds are positive and have eight changes. The heads are independent in their movements, both as to direction and amount of feed, and can be set to any angle. The tool-bars have a movement of 19 inches and either can be brought to the center for boring.

Code-Word	[illegible]
Code-Word, for universal chuck-jaws	GALAHAT



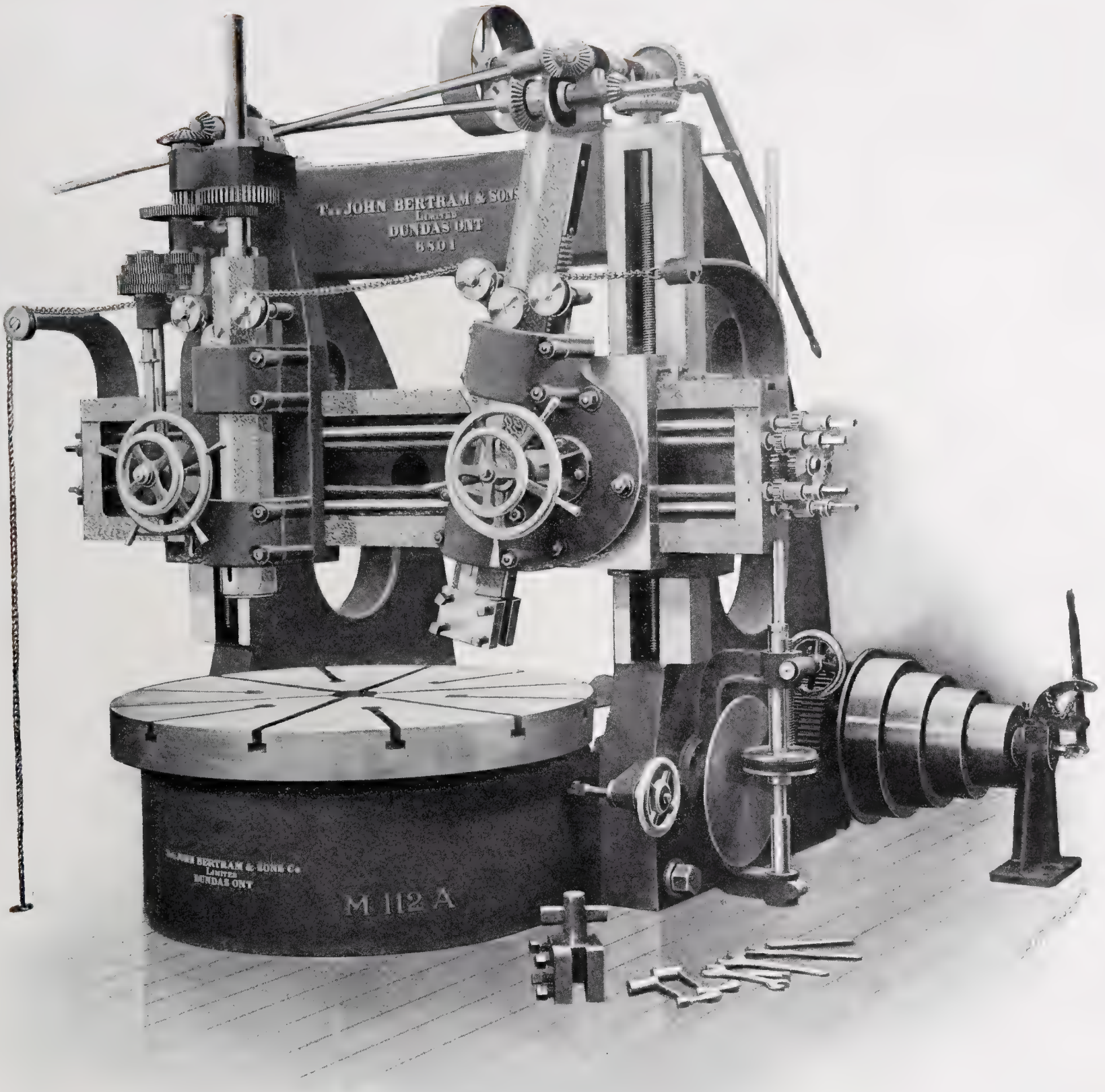
42-INCH BORING AND TURNING MILL

MOTOR DRIVEN

No. M-117 D

SWINGS 42 inches in diameter. Greatest height under tools, 20 inches. The feeds are positive and have eight changes. The heads are independent in all their movements, both as to direction and amount of feed, and can be set to any angle. The table in the machine illustrated is fitted with three combination chuck-jaws, but either independent or universal chuck-jaws can be provided if desired.

Code-Word . . . . . GAINULES
Code-Word, for combination chuck-jaws . . . . . GALAICO
Code-Word, for direct-connected motor. . . . . ICEBERG



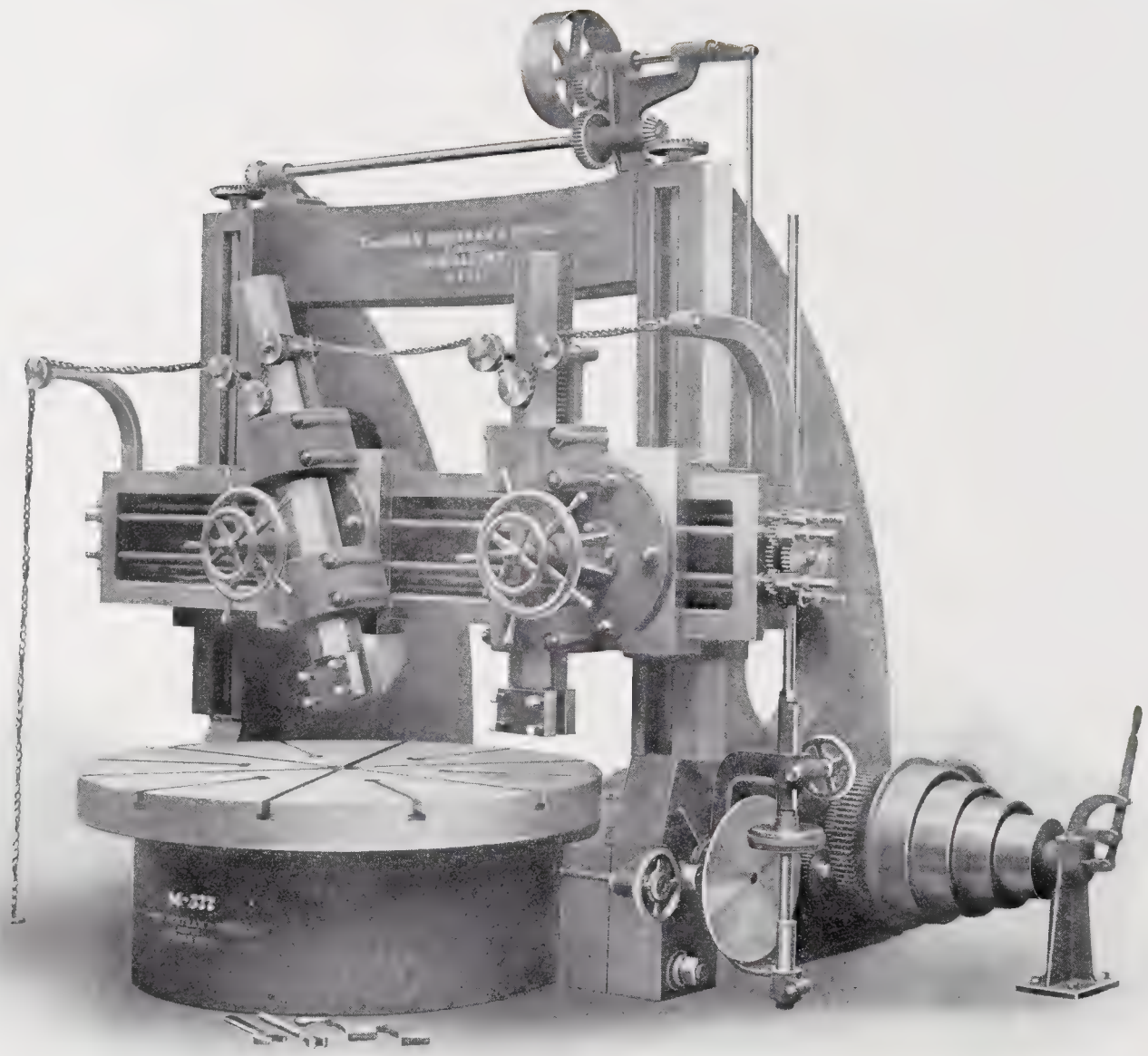
60-INCH BORING AND TURNING MILL

WITH LEFT-HAND HEAD ARRANGED WITH INDEPENDENT BORING-BAR

No. M-112 A

SWINGS 60 inches in diameter. Greatest height under tools, 51 inches. The left-hand tool-bar is replaced by a boring and drilling spindle with independent drive and feed gear. This machine is particularly useful for boring crank-pin holes in engine-crank discs and similar work, as the work can be finished without resetting. The standard feed-mechanism for boring-bar is somewhat different from that illustrated, each head being independent in its movements as to direction and amount of feed.

Code-Word . . . . . GAIPEIRO
Code-Word, for left-hand head arranged with independent boring-bar . . . . . GAITERED
Code-Word, for direct-connected motor . . . . . ICEBERG

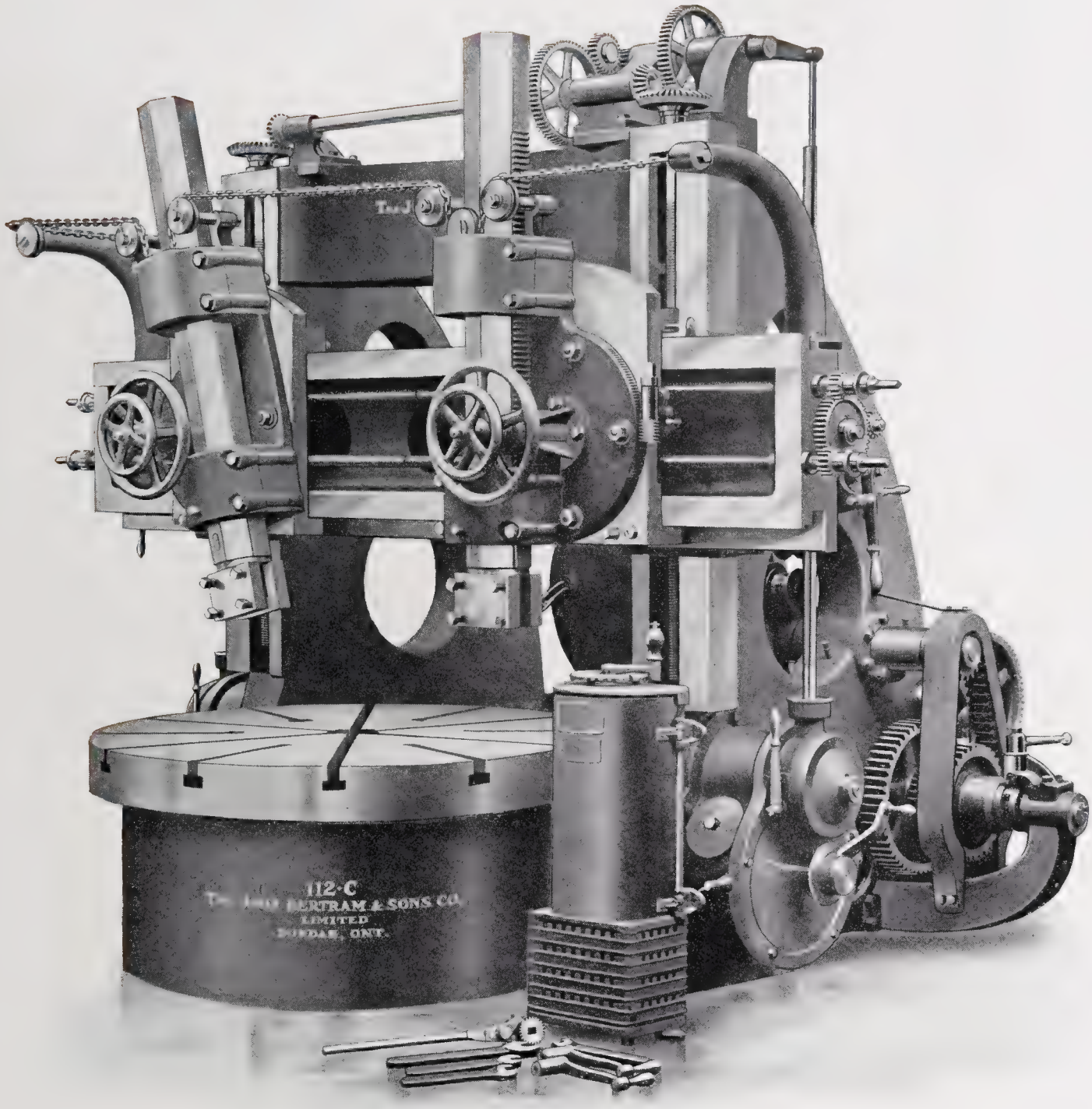


60-INCH BORING AND TURNING MILL

No. M-112

SWINGS 60 inches in diameter. Greatest height under tools, 50 inches. The heads are independent in their movements. The feeds are positive, having ten changes. The tool-bars have a vertical movement of 30 inches, and either can be brought to the center for boring.

Code-Word . . . . . GAIPEIRO
Code-Word, for direct-connected motor. . . . . ICEBERG



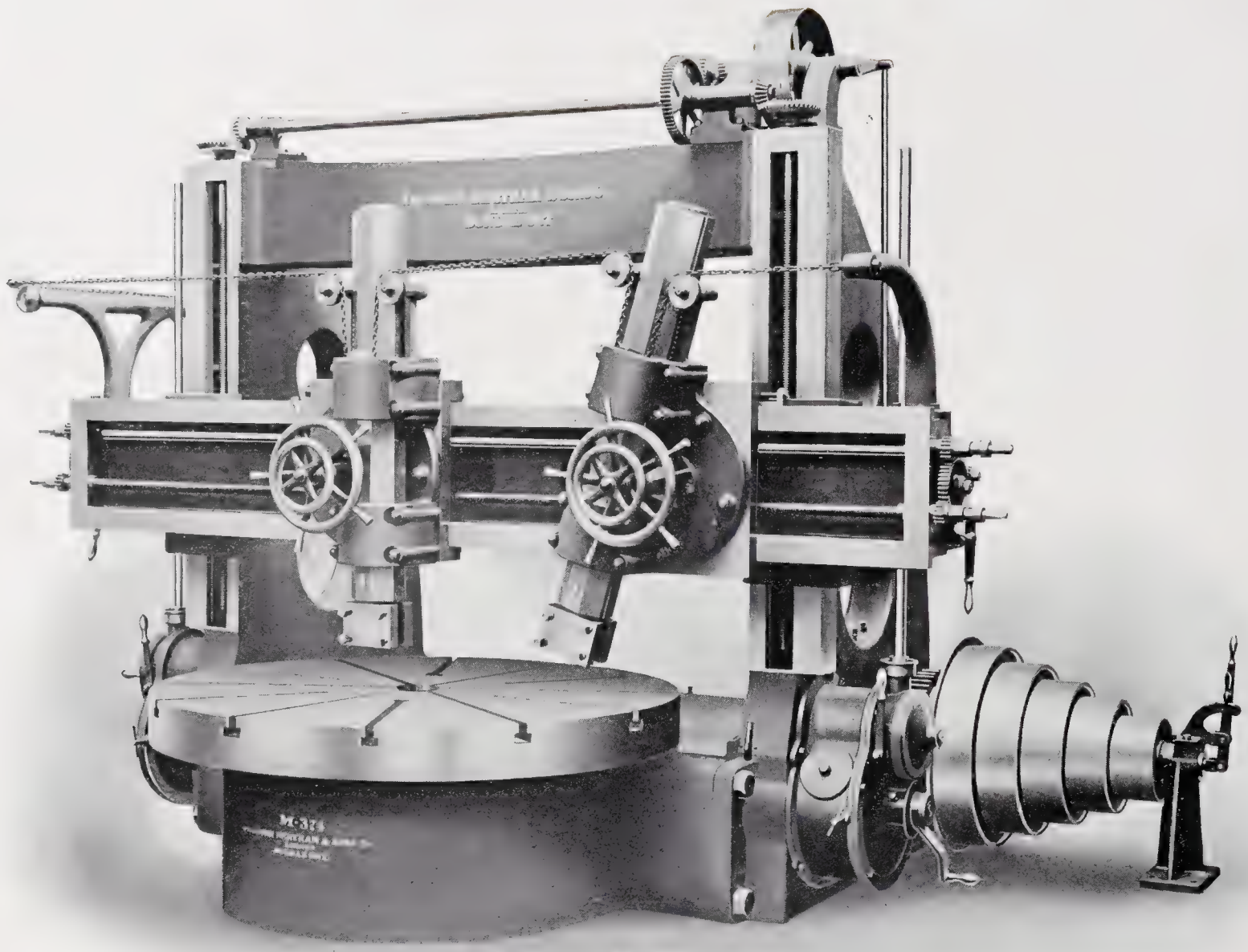
6-FOOT BORING AND TURNING MILL

MOTOR DRIVEN

No. M-377 C

SWINGS 72 inches in diameter. Greatest height under tools, 44 inches. The heads have rapid hand-traverse on the crossrail by rack and pinion. The feeds are positive, having ten changes. The tool-bars have a vertical movement of 36 inches, and either can be brought to the center for boring.

Code-Word	GAIREOWI
Code-Word, for direct-connected motor	ICEBERG

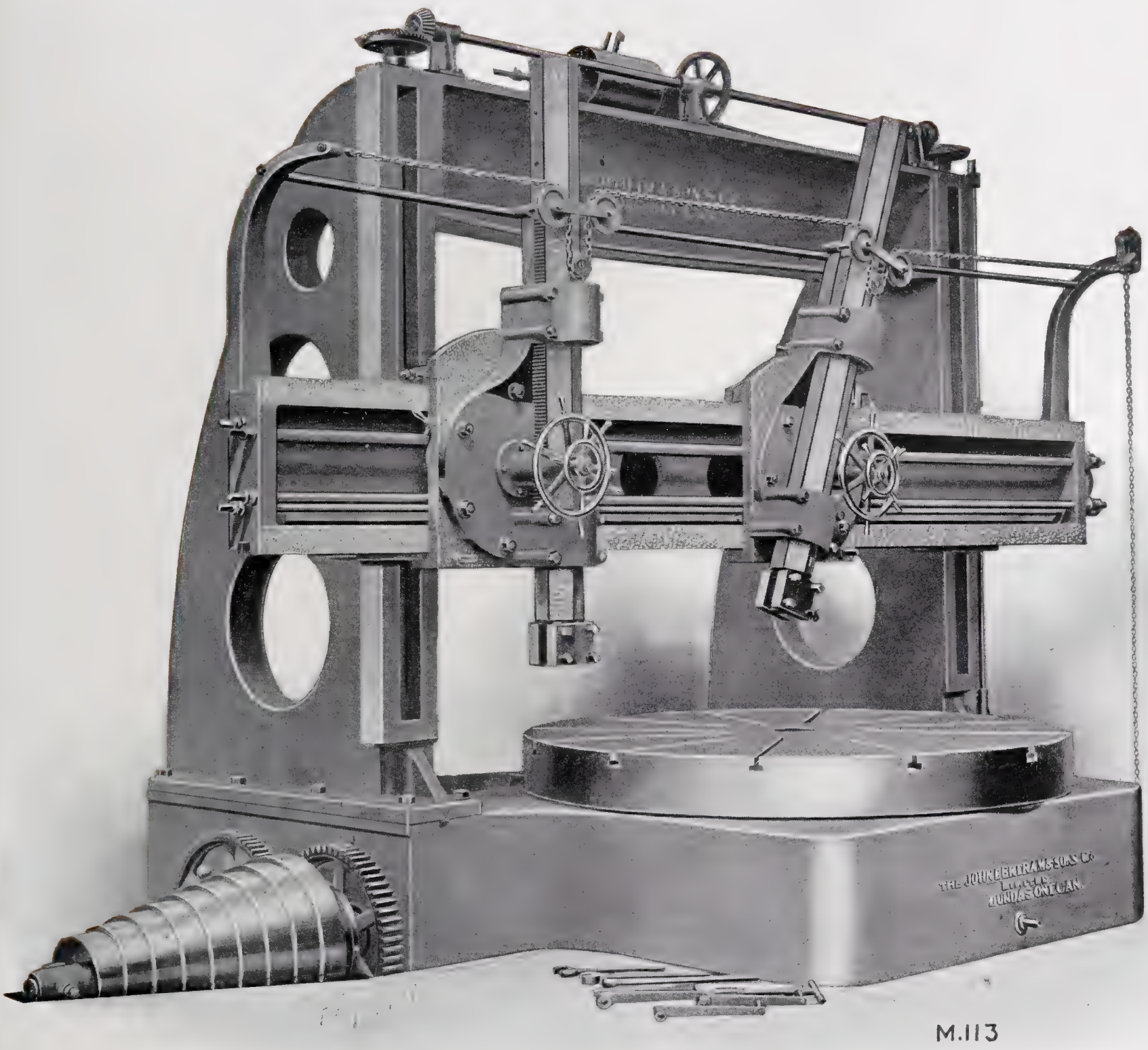


7-FOOT BORING AND TURNING MILL

No. M-374

SWINGS 84 inches in diameter. Greatest height under tools, 95 inches. Saddles are arranged for quick traverse by rack and pinion. The feeds are positive, and the heads are independent of each other in all movements.

Code-Word . . . . . GAIRISH
Code-Word, for direct-connected motor . . . . . ICEBERG



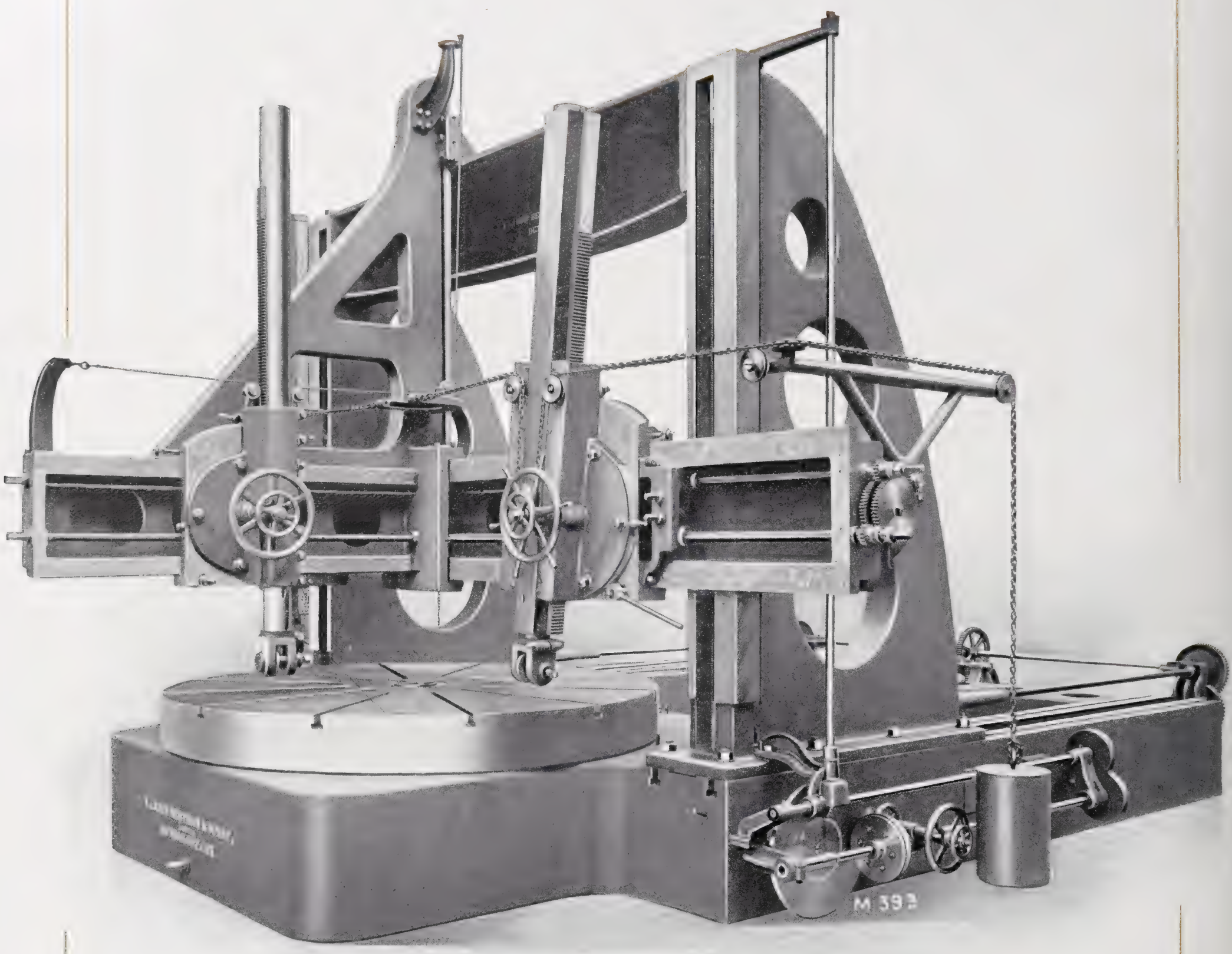
M.113

12-FOOT BORING AND TURNING MILL

No. M-113

SWINGS 144 inches in diameter. Greatest height under tools, 90 inches. The heads are independent in their movements, and have rapid traverse on the crossrail by rack and pinion, and are set to angle by ratchet and worm.

Code-Word . . . . . GAISSIN
Code-Word, for direct-connected motor . . . . . ICEBERG

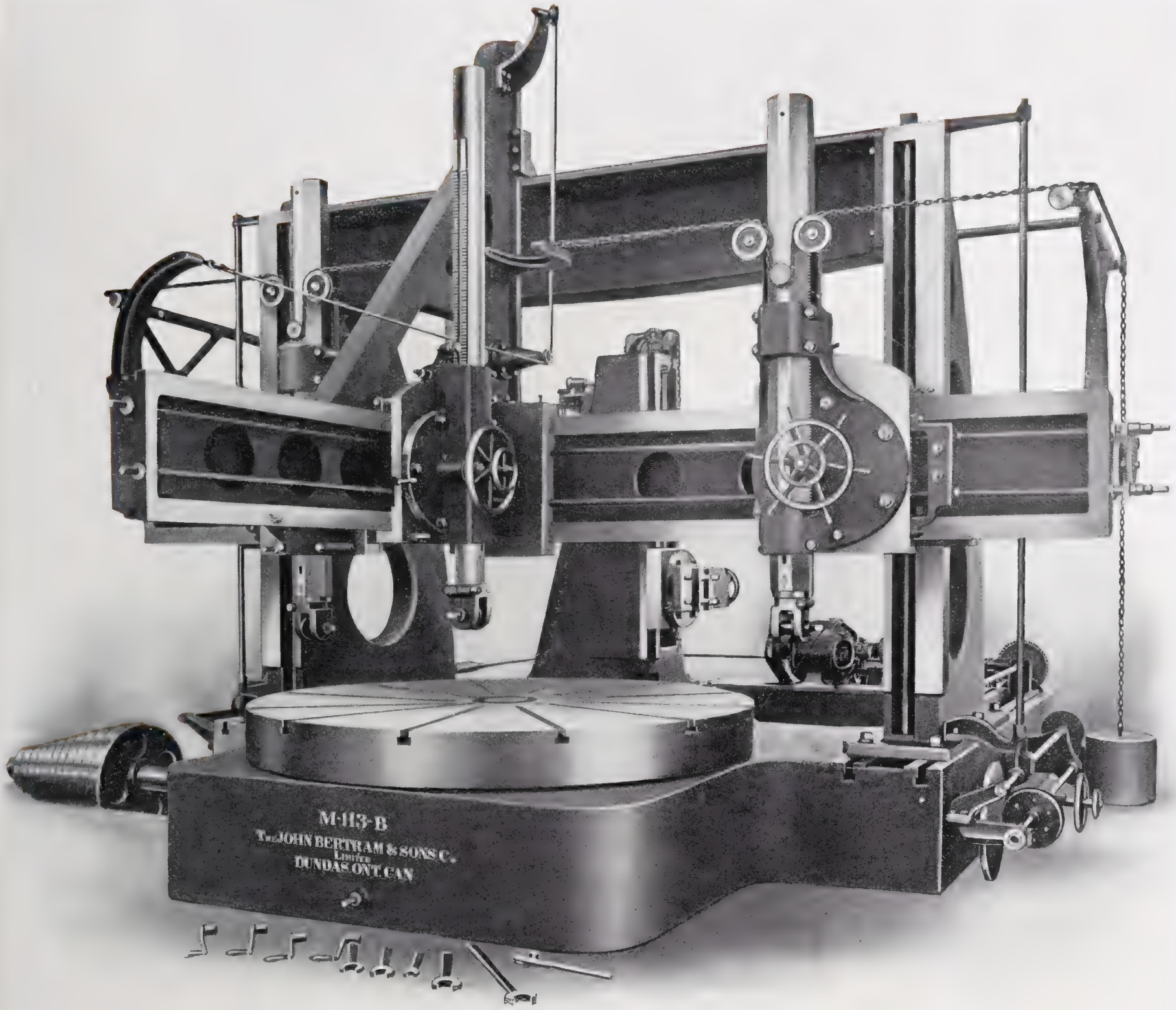


10-16-FOOT BORING AND TURNING MILL

No. M-393

SWINGS 10 feet when the housings are in a forward position and 16 feet when the housings are moved back. Greatest height under tools, 66 inches. The extension crossrail reaches to the center of the table, and carries a large boring-bar with power-feed and rapid hand traverse. The housings are moved by power.

Code-Word, without boring-bar . . . . . GAITANO
Code-Word, with boring-bar. . . . . GAITEADAS

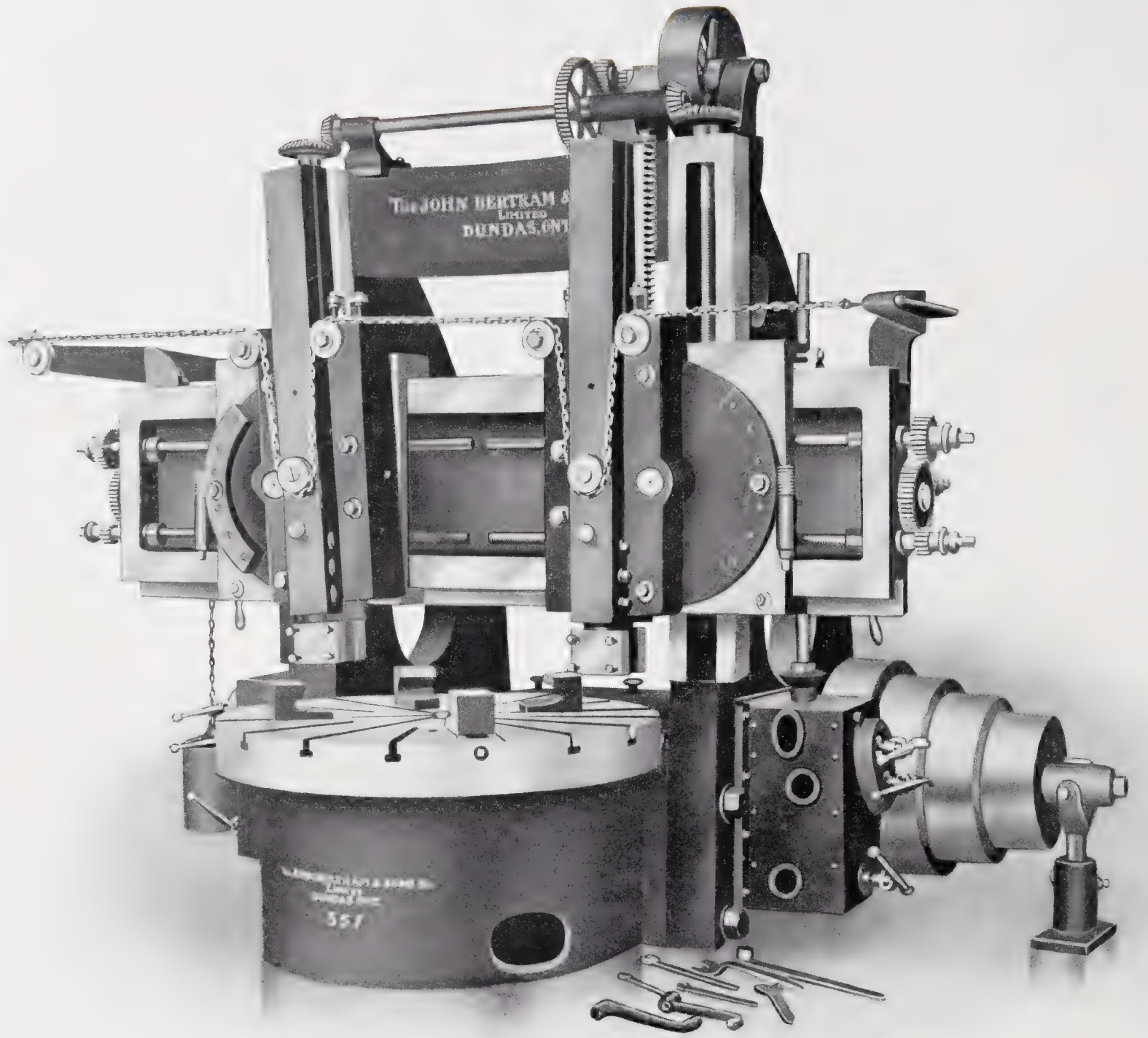


12-18-FOOT BORING AND TURNING MILL

No. M-113 B

SWINGS 12 feet when the housings are in a forward position and 18 feet when the housings are moved back. Greatest height under tools, 80 inches. The extension crossrail reaches to the center of the table, and carries a large boring-bar with power-feed and rapid hand-traverse. The machine illustrated is provided with a rear tool-column, which may be adjusted in and out so that diameters from 18 feet down to 12 feet may be turned. The tool-slide has vertical power-feed and quick hand-adjustment. The machine is driven by a variable speed motor. Auxiliary motors are provided for moving the housings and elevating the crossrail.

Code-Word, without boring-bar . . . . . GAITEANDA
Code-Word, with boring-bar. . . . . GAITEANTE
Code-Word, for rear tool-column . . . . . GALANTE



50-INCH TIRE MILL

WITH ADJUSTABLE CROSSRAIL

No. M-357

THIS mill is specially designed for rough turning and finishing steel tires. Swings 51 inches in diameter, and takes work under the tool-holders 33 inches. The table is 49¾ inches in diameter and has eight changes of speed. The crossrail is provided with two saddles, made right and left for close work. Either saddle will move to the center for boring. The feeds are positive, operate at any angle, and are independent of each other in all movements. This mill may be built with either fixed or adjustable crossrail.

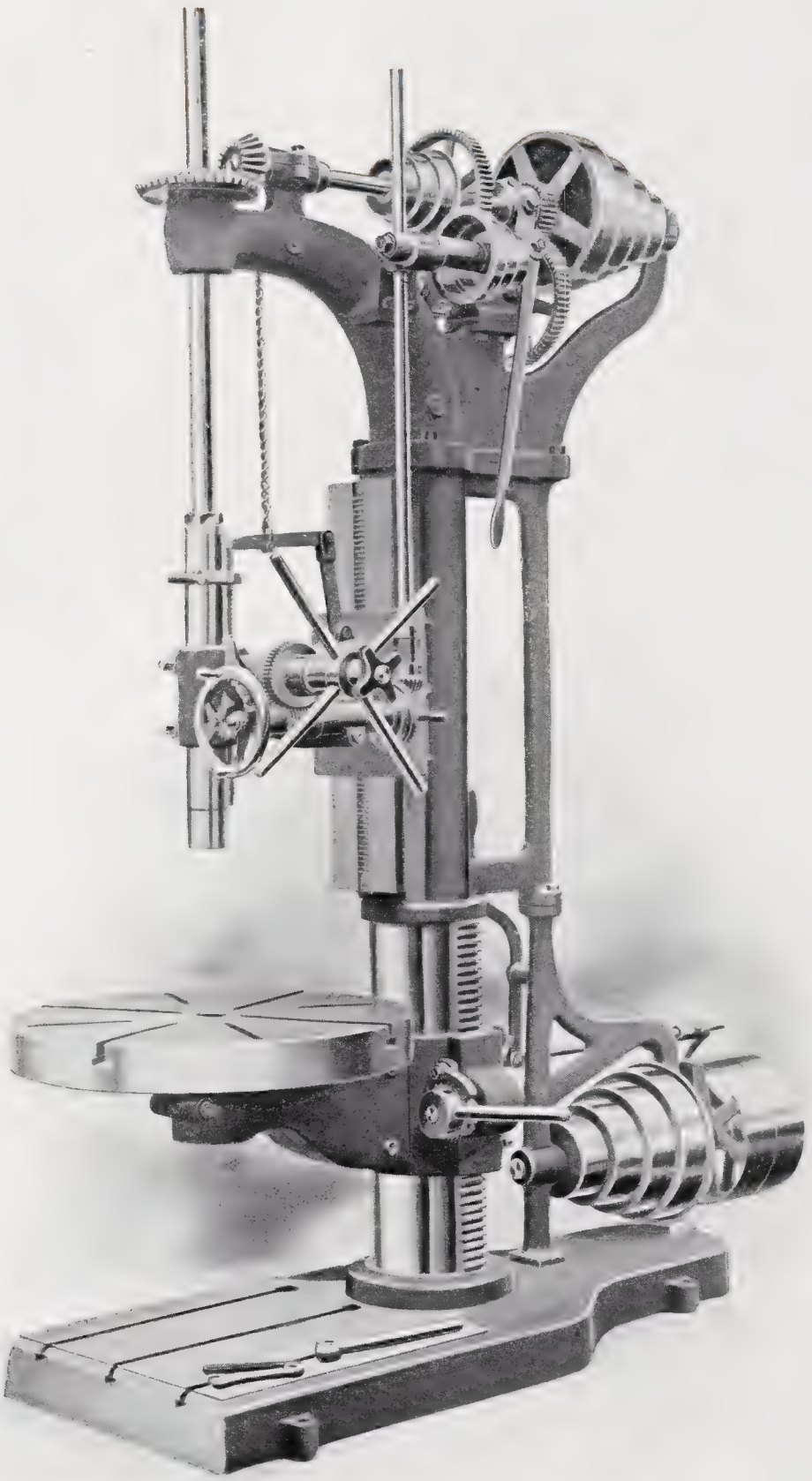
Code-Word, with fixed crossrail . . . . . GALEAVIT
Code-Word, with adjustable crossrail . . . . . GALEBEER

VERTICAL DRILLING MACHINES

THESE drills have been entirely re-designed, and in addition to being heavier and more powerful, particular attention has been given to the convenient and efficient arrangement of the varied parts. The spindles are counterweighted, have power- and hand-feeds and rapid vertical adjustment by hand-lever. The tables may be swung out of the way when large work is being drilled, and may be locked centrally in line with the spindle for boring on the table. The tables have a vertical adjustment on the column by rack and pinion, and on large-sized machines by worm wheels.

DIMENSIONS

Size of Machine	Distance Center of Spindle to Column	Greatest Distance Spindle to		Traverse of Spindle	Countershaft-Pulleys		Code-Word
		Table	Base		Dimensions	Revolutions	
Inches	Inches	Inches	Inches	Inches	Inches		
20	[illegible]	34	48	8	10 x 3	325	GASHAHN
25	[illegible]	34	48	10	15 x 3	200	GASHFUL
[illegible]	15½	42	59	[illegible]	14 x 4	200	GASIFERO
[illegible]	[illegible]	42	59	15½	14 x 4	200	GASIFICAR
45	23	39	63½	14	18 x 5	250	GASINDIO

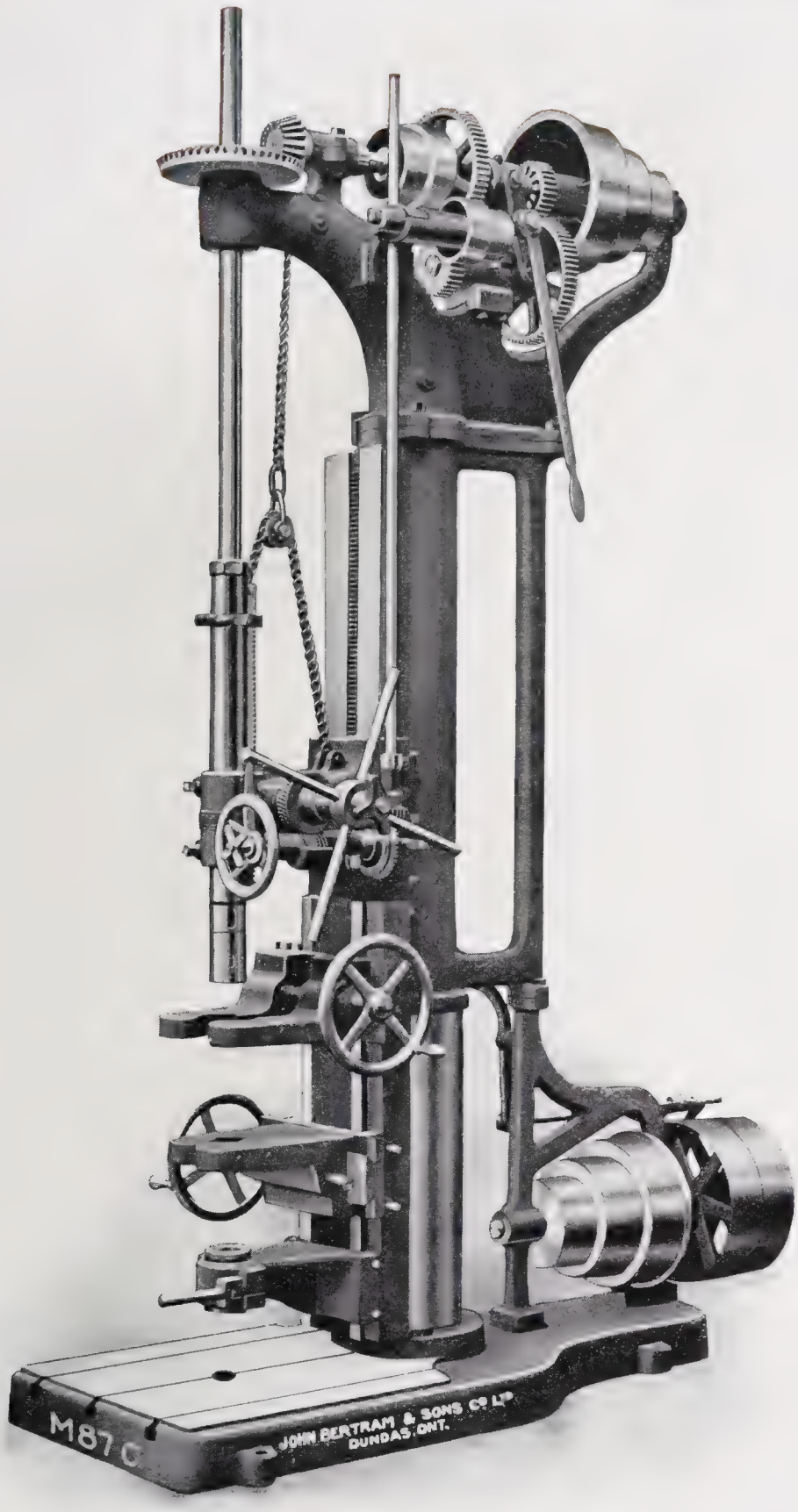


30-INCH VERTICAL DRILLING MACHINE

No. M-87

DISTANCE from center of spindle to column, 15½ inches. Greatest distance from spindle to table, 42 inches. Greatest distance from spindle to base-plate, 59 inches. The spindle has 12½-inch vertical traverse. The table swings clear of the base-plate on either side. The base-plate is slotted for securing work.

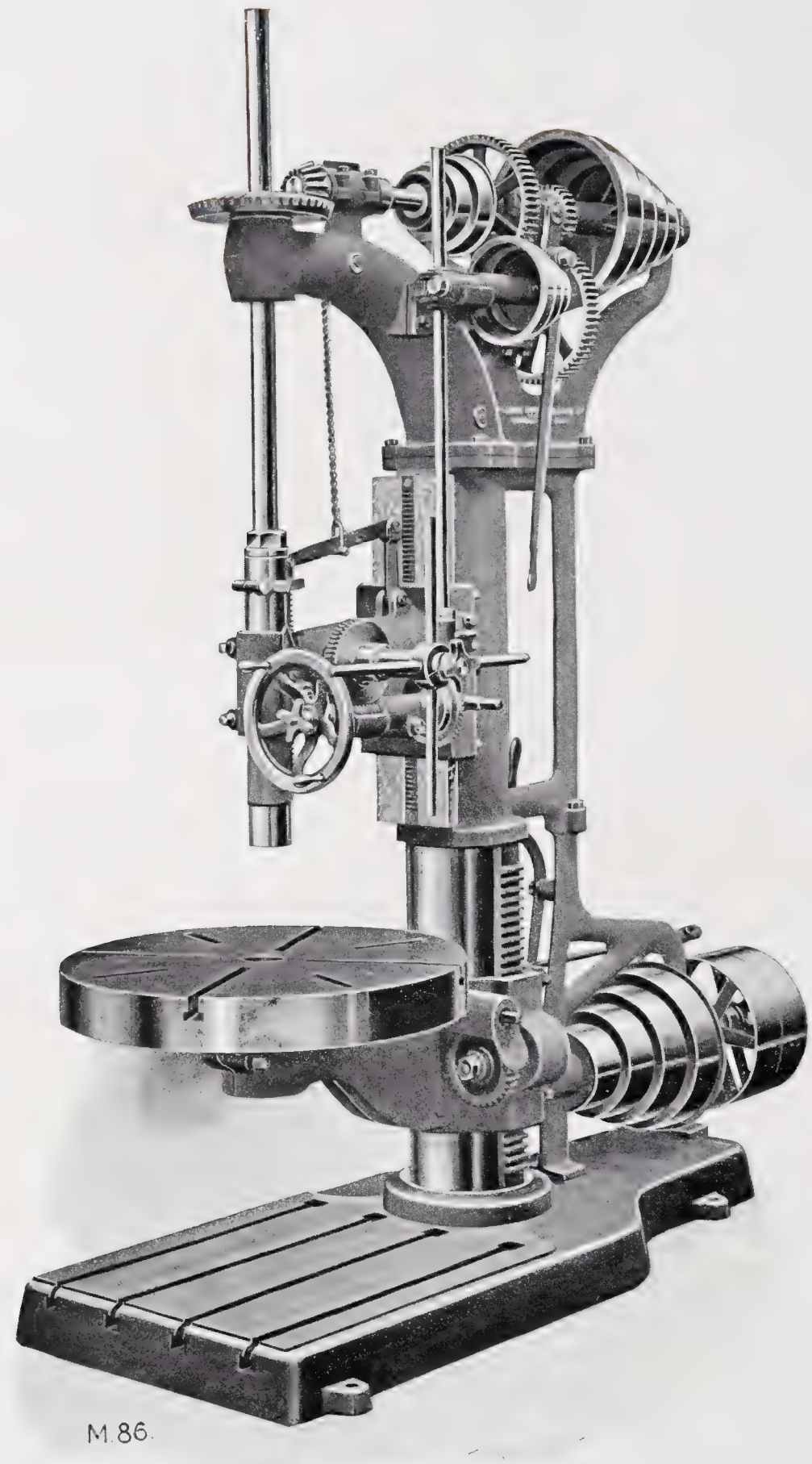
Code-Word GASIFERO



30-INCH UPRIGHT BORING MACHINE

THIS machine is similar to our standard drills, and is designed for boring pump cylinders or for any work where a long traverse of spindle is necessary. It is provided with a very long column for sliding-head, a great vertical range of spindle, and a pair of double-jaw self-centering chucks, which are detachable, vertically adjustable to each other and to the spindle. The boring-bar is supported at the bottom in an adjustable dust-proof bearing. Distance from center of spindle to column, 15½ inches. Greatest distance from spindle to base-plate, 55 inches.

Code-Word

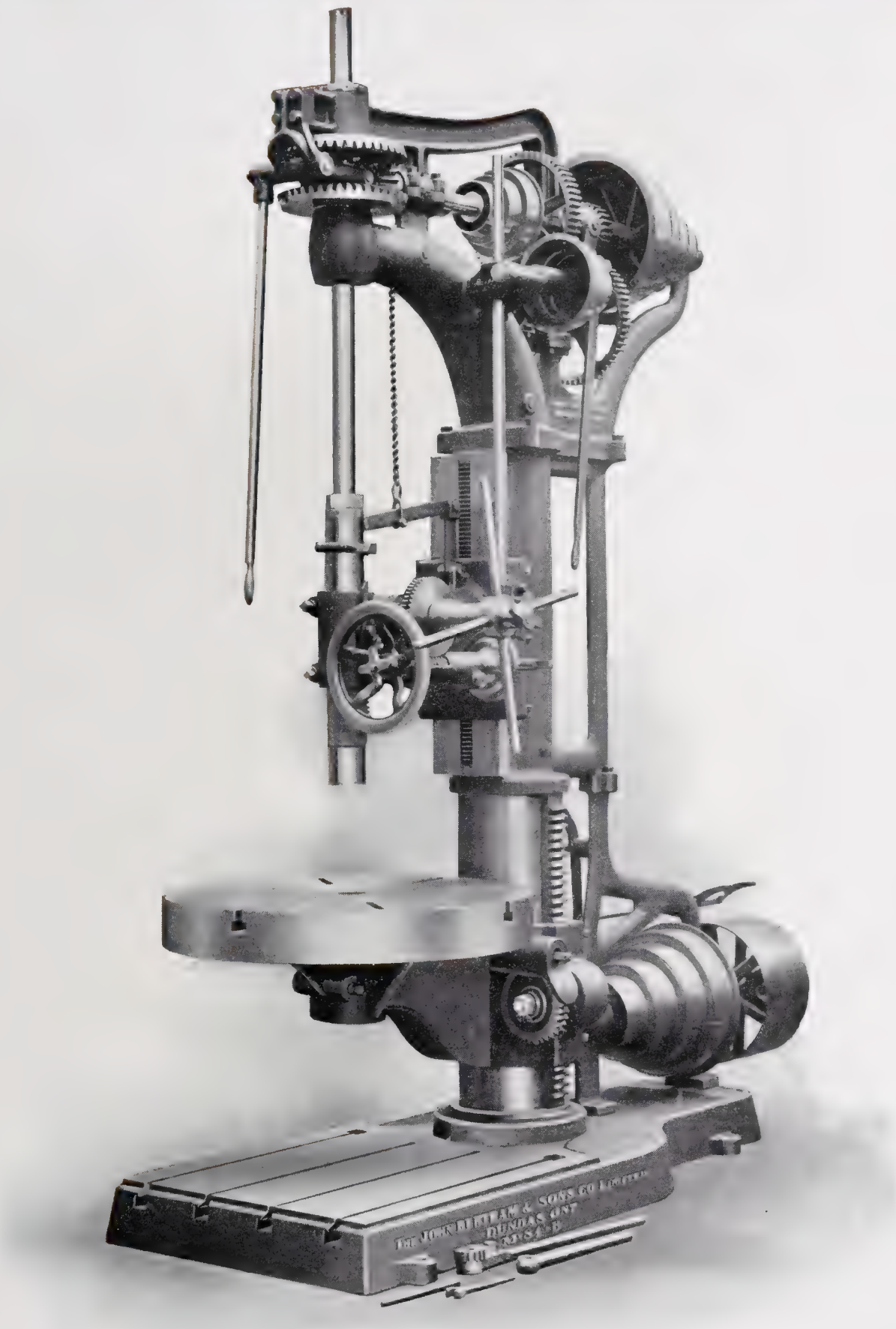


36-INCH VERTICAL DRILLING MACHINE

No. M-85

DISTANCE from center of spindle to column, 18½ inches. Greatest distance from spindle to table, 42 inches. Greatest distance from spindle to base-plate, 59 inches. The spindle has 15½-inch vertical traverse. The table swings clear of the base-plate on either side, and has an adjustment on the column by rack and pinion.

Code-Word . . . . . GASIFICAR



45-INCH VERTICAL DRILLING MACHINE

No. M-86

THIS machine is designed for the most accurate drilling. The spindle at its lower end is carried on a long slide. It has three changes of power-feeds as well as rapid hand-movement, and when so ordered can be provided with reverse gear for tapping, conveniently located in the drill-head. Distance from center of spindle to column, 23 inches. Greatest distance spindle to table, 39 inches; to base-plate, 63½ inches. The spindle has 14-inch traverse. The table swings clear of the base-plate in both directions, and is raised and lowered by worm wheels.

Code-Word . . . . . GASINDIO
Code-Word, for tapping attachment . . . . . GASLEK

RADIAL DRILLING MACHINES

ON the following pages we illustrate a line of Universal and Plain Radial Drilling Machines. These machines are designed for the heaviest service. They have wide floor-plates of deep box form, well ribbed inside, on which is mounted a heavy column of large bearing surface. On the column is a saddle on which is mounted a swivelling arm. The head on the arm has a counterbalanced sleeve-spindle of large diameter, with automatic feeds, ample travel and quick return. All hand-wheels controlling the traverse of the saddle, quick return of spindle and feed mechanism, are located on the saddle in such a manner as to permit of convenient handling. In this respect the motor-driven machine is particularly advantageous, as the controller is placed at the side of the column and may be operated by handle within convenient reach of the operator. In the full universal machines both arm and saddle swivel, and in machines with plain arm the saddle alone swivels. The arms are raised and lowered by power.

DIMENSIONS

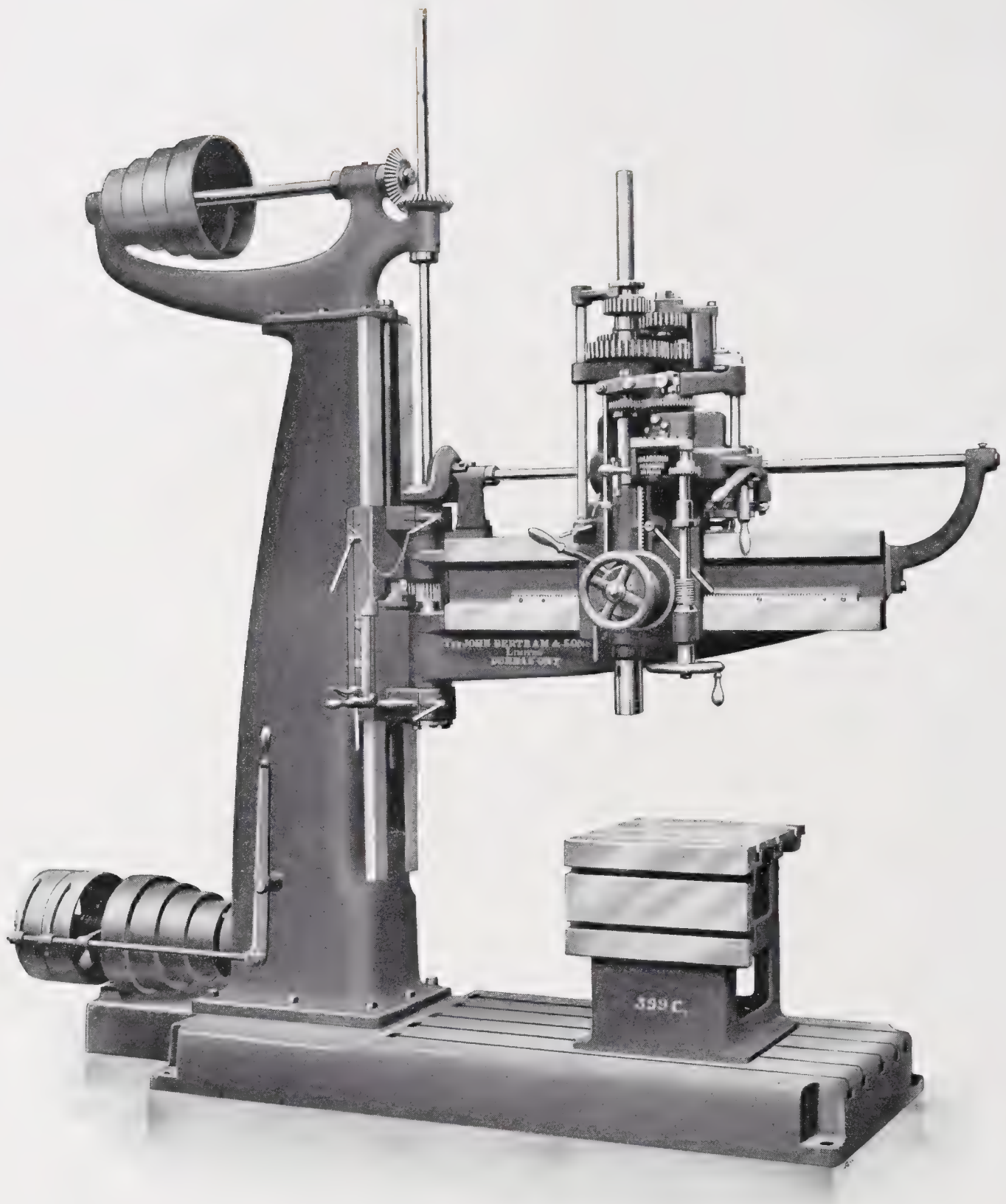
PLAIN RADIAL DRILLING MACHINES

SIZE	Greatest Diameter will Drill to the Center of	Greatest Distance from Face of Column to Center of Spindle	Greatest Distance Base-Plate to Spindle	Traverse of Spindle	Countershaft-Pulleys		Code-Word
					Dimensions	Revolutions	
Feet	Feet	Inches	Inches	Inches	Inches		
3½	7	44	46	14	14 x 4	240	GARRICK
4	8	50	57	14	14 x 4	240	GARRIDAS
5	10	62½	60	18	16 x 4½	245	GARRIDICE
6	12	74½	72	18½	18 x 5	245	GARRIEBAT
7	14	88	85	20	20 x 5½	200	GARRIENS

DIMENSIONS

UNIVERSAL RADIAL DRILLING MACHINES

SIZE	Greatest Diameter will Drill to the Center of	Greatest Distance from Face of Column to Center of Spindle	Greatest Distance Base-Plate to Spindle	Traverse of Spindle	Countershaft-Pulleys		Code-Word
					Dimensions	Revolutions	
Feet	Feet	Inches	Inches	Inches	Inches		
5	10	61	66	18	16 x 4½	320	GARRIDURA
6	12	73	73	18	18 x 6	225	GARRIENDI
7	14	86	86	20	20 x 7	250	GARRIET

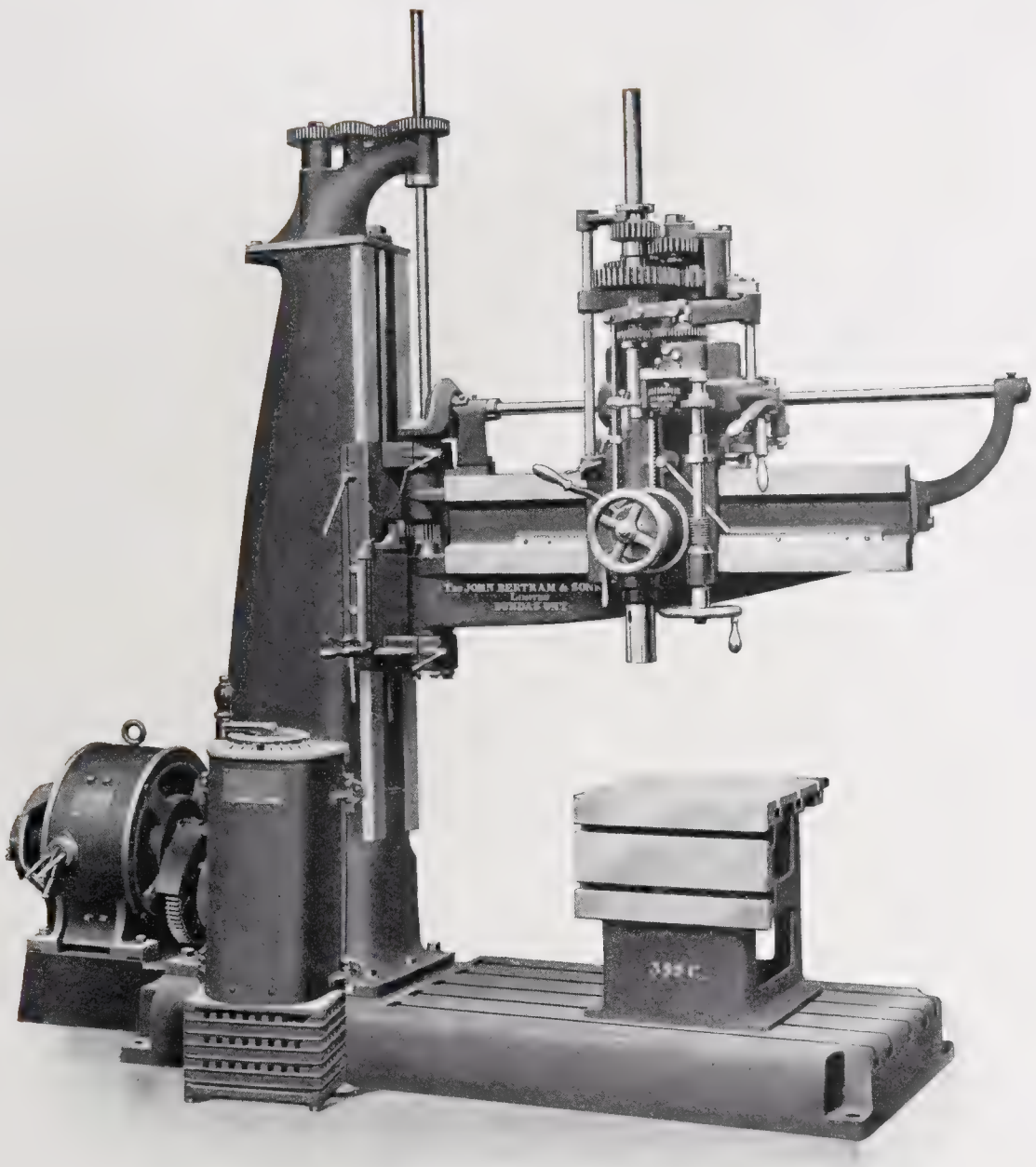


4-FOOT RADIAL DRILLING MACHINE

No. M-399 C

THIS machine is designed for the heaviest service. Will drill to the center of an 8-foot circle. Greatest distance face of column to center of spindle, 50 inches. Greatest distance from spindle to base-plate, 57 inches. The spindle has a traverse of 14 inches and is provided with automatic stop and quick advance and return. The base-plate has "T" slots for securing the work and box-table. Drill can be furnished driven by belt or from speed-box, as desired.

Code-Word, belt driven . . . . . GARRIDAS
Code-Word, for speed-box . . . . . GARRIRE



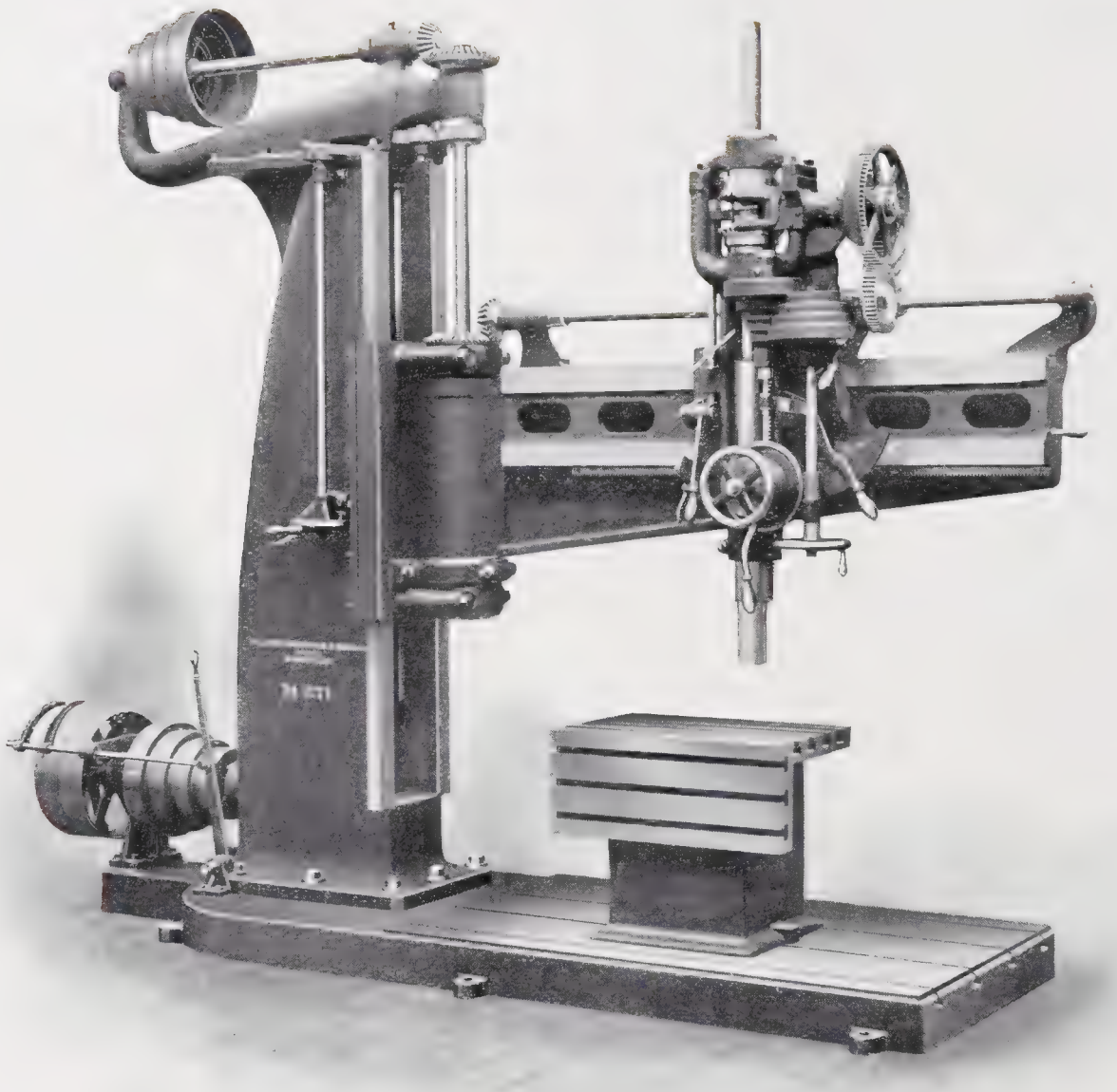
4-FOOT RADIAL DRILLING MACHINE

MOTOR DRIVEN

No. M-399 B

WILL drill to the center of 8-foot circle. Greatest distance from face of column to center of spindle, 50 inches. Greatest distance from base-plate to spindle, 57 inches Vertical travel of spindle, 14 inches. The drill is fitted with a variable-speed 3 H. P. motor set on an extension of the base, with speed controller located within convenient reach of the operator.

Code-Word, for direct-connected motor . . . . . ICEBERG
Code-Word, for speed-box . . . . . GARRIRE

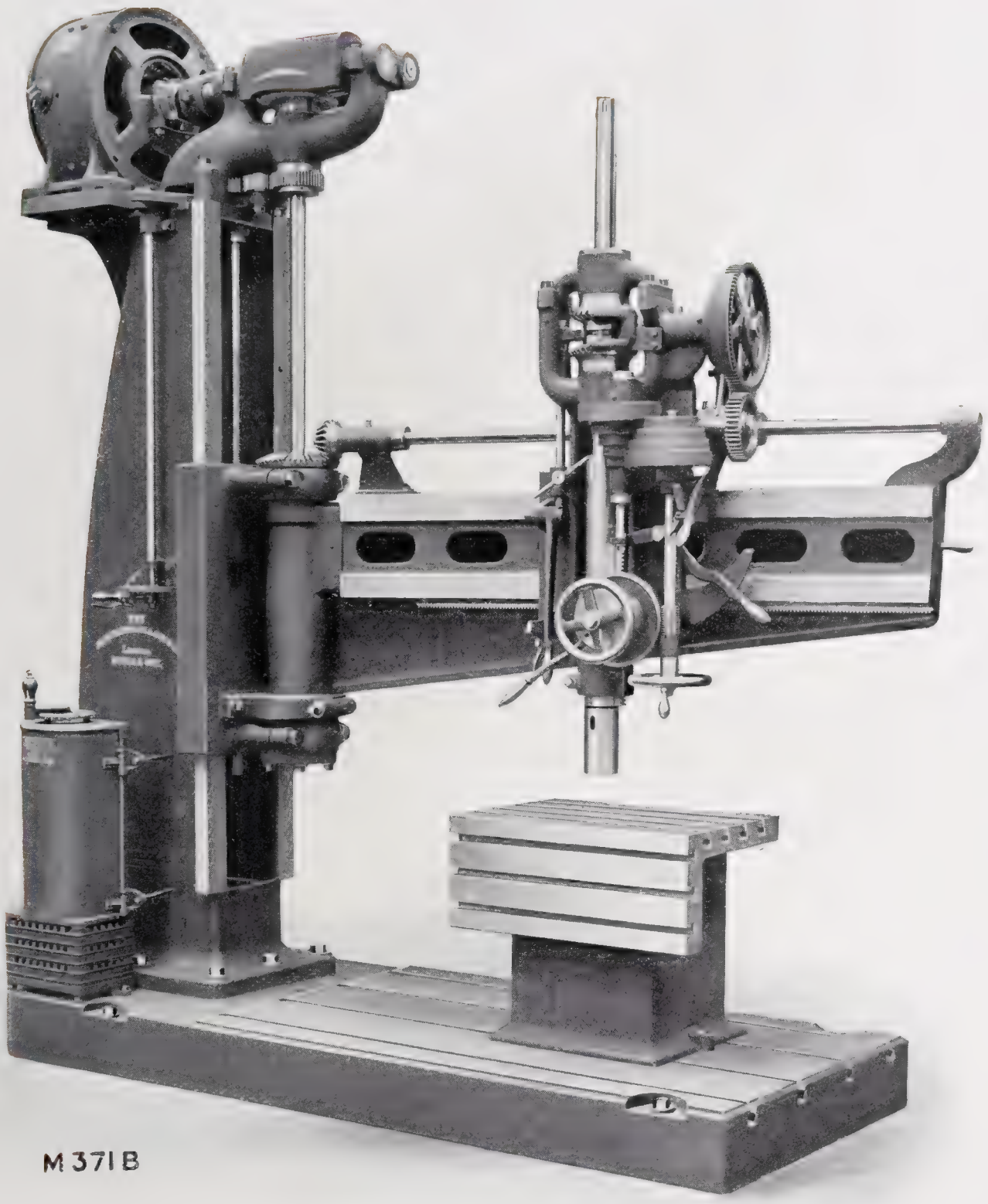


5-FOOT RADIAL DRILLING MACHINE

No. M-371

THIS machine is designed for the heaviest service. Will drill to the center of a 10-foot circle. Greatest distance from face of column to center of spindle, 62½ inches. Greatest distance from base-plate to spindle, 60 inches. The traverse of spindle is 18 inches.

Code-Word, belt driven . . . . . GARRIDICE
Code-Word, for direct-connected motor . . . . . ICEBERG



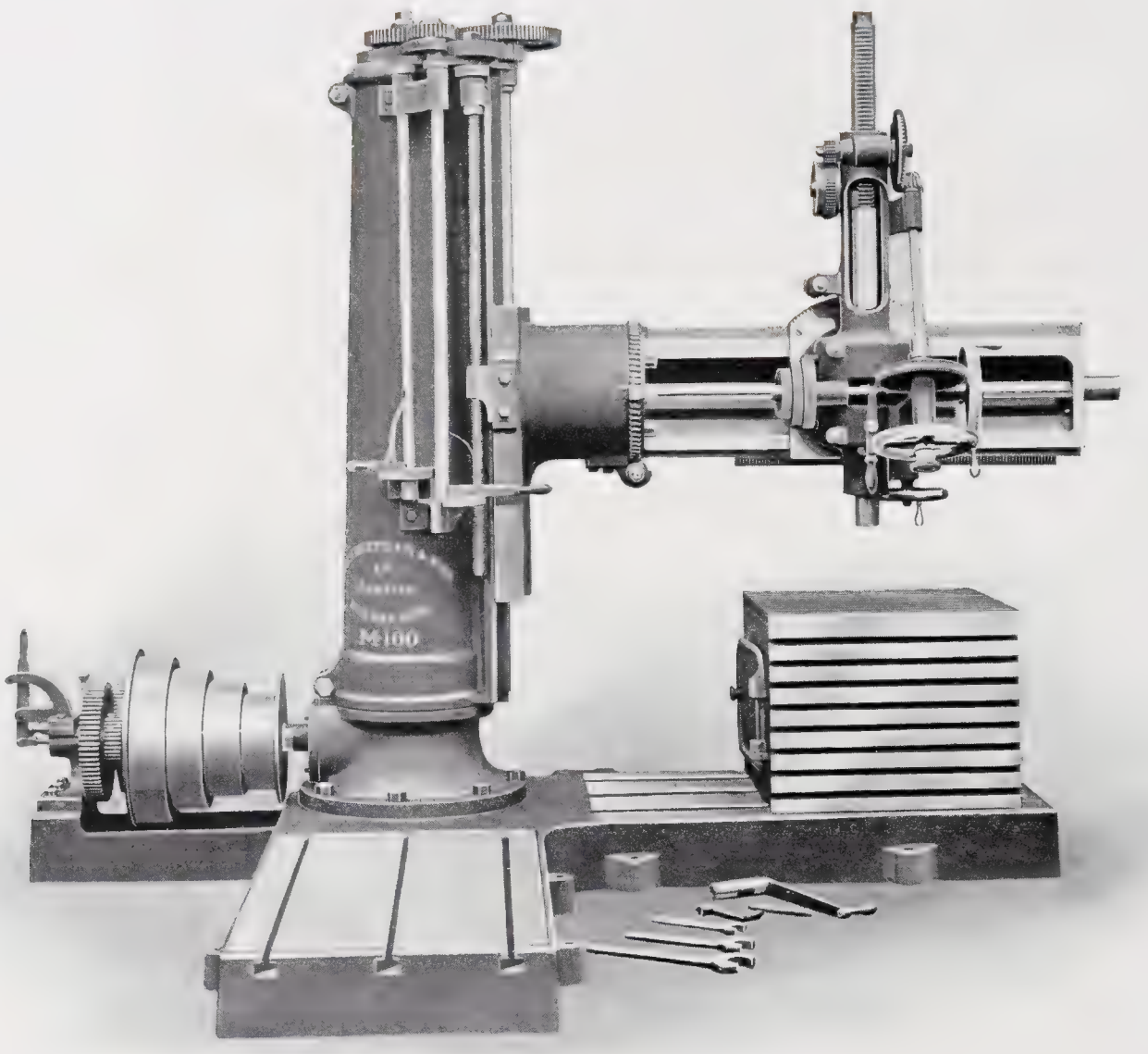
6-FOOT RADIAL DRILLING MACHINE

MOTOR DRIVEN

No. M-371 B

WILL drill to the center of 12-foot circle. Greatest distance from face of column to center of spindle, 74½ inches. Greatest distance from base-plate to spindle, 72 inches. Traverse of spindle, 18½ inches.

Code-Word, belt driven . . . . . GARRIEBAT
Code-Word, for direct-connected motor. . . . . ICEBERG



6-FOOT UNIVERSAL RADIAL DRILLING MACHINE

No. M-100

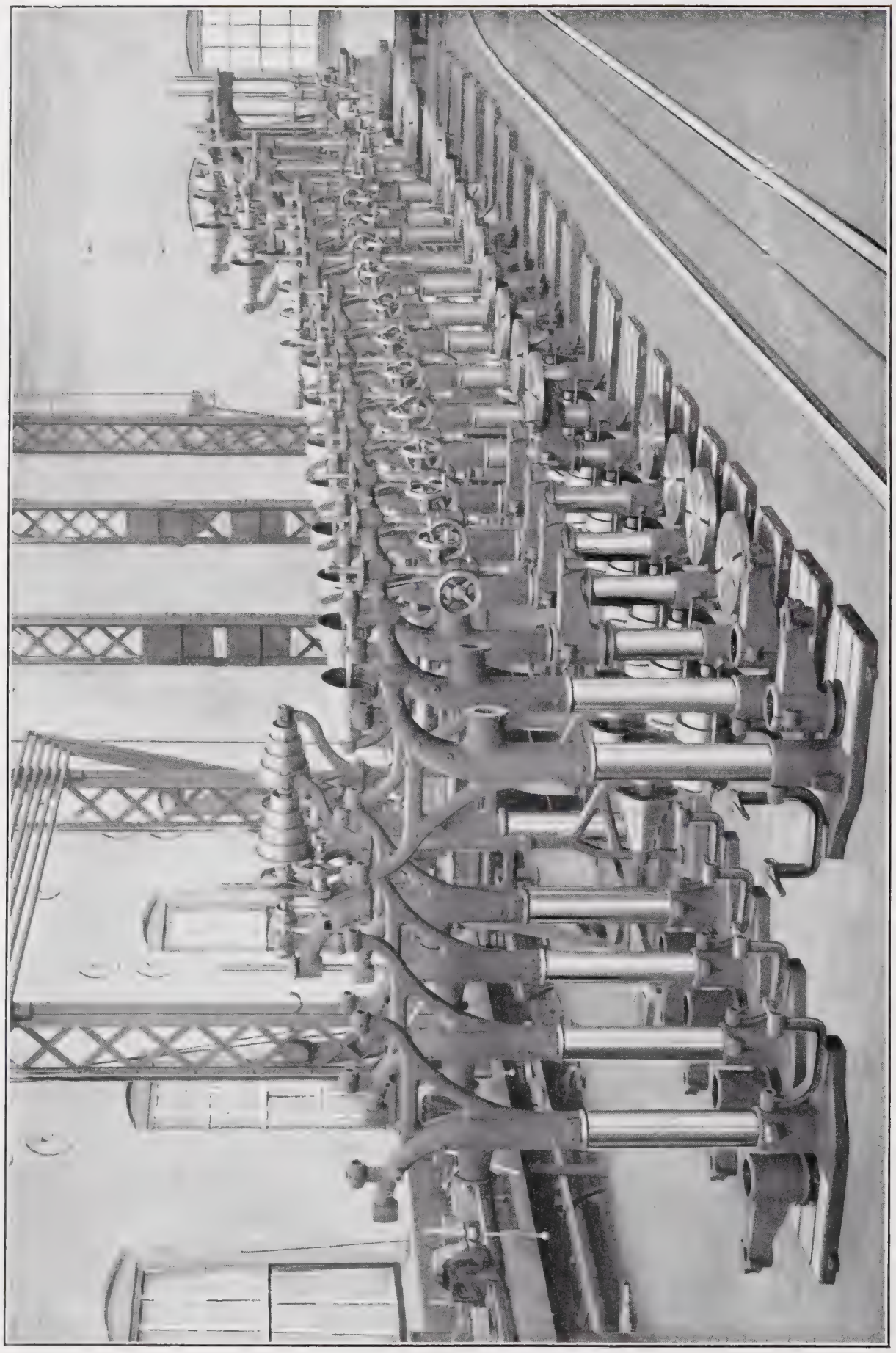
THIS machine is provided with swivelling saddle and swivelling arm. The drill has rapid hand-traverse on the arm and will drill to the center of a 12-foot circle. Greatest distance from face of column to center of spindle, 73 inches. Greatest distance from base-plate to spindle, 73 inches. The spindle has a vertical traverse of 18 inches.

Code-Word, belt driven . . . . . GARRIENDI
Code-Word, for direct-connected motor . . . . . ICEBERG

SUSPENSION DRILL

No. M-90

THIS machine is intended to be attached to the ceiling or overhead frame, leaving the space below entirely clear, so that boiler sheets or large work can be easily drilled. The spindle is 2-3/16 inches in diameter, has 19-inch traverse by hand or power feed, is back geared and has eight changes of speed and quick hand movement.



INTERIOR VIEW
SHOWING VERTICAL DRILLS IN PROCESS OF CONSTRUCTION

MILLING MACHINES

PLAIN AND UNIVERSAL MILLING MACHINES

IN the design and construction of our Plain and Universal Milling Machines particular attention has been given to the simplicity of detail and ease of handling. The tables are wide and deep. The saddles are very long, and on the universal machines swivel on a graduated base to 45 degrees either way from the straight position, and are firmly held by bolts in a "T" slot in the swivelling-block. Dividing-heads having power rotary feed are furnished on the universal machines, and if ordered may be provided for the plain machines. The machines are usually furnished with power longitudinal feed only, but when ordered may be supplied with power cross and vertical feeds.

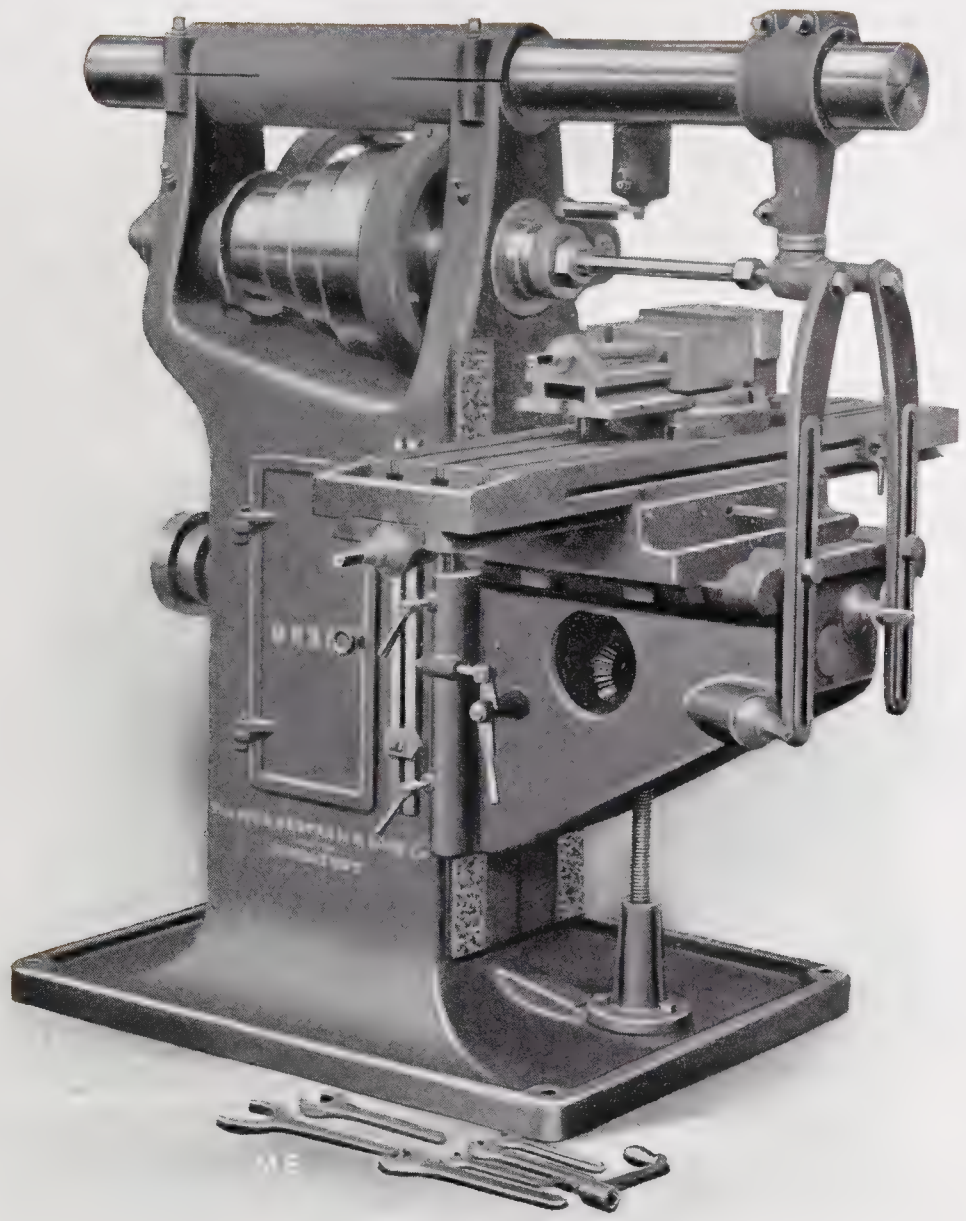
DIMENSIONS

PLAIN MILLING MACHINES

No. of Machine	Working Surface of Table	Longitudinal Movement of Table	Transverse Movement of Table	Vertical Adjustment of Table	Countershaft-Pulleys		Code-Word
					Dimensions	Revolutions	
	Inches	Inches	Inches	Inches	Inches		
[illegible]	32 x 5½	19	6	18	11 x 3	170	GRAXEANDO
5	39 x 8½	24	7½	18	12 x 3	150	GRAXEARAS
6	47½ x 12	34	8	20	15 x 4	140	GRAXEAREM

UNIVERSAL MILLING MACHINES

[illegible]	32 x 5½	19	6	16	11 x 3	170	GRAXEARMOS
5	39 x 8½	[illegible]	7½	16	12 x 3	[illegible]	GRAXEASTES
6	47½ x 12	30	8	[illegible]	15 x 4	140	GRAXEAVEIS



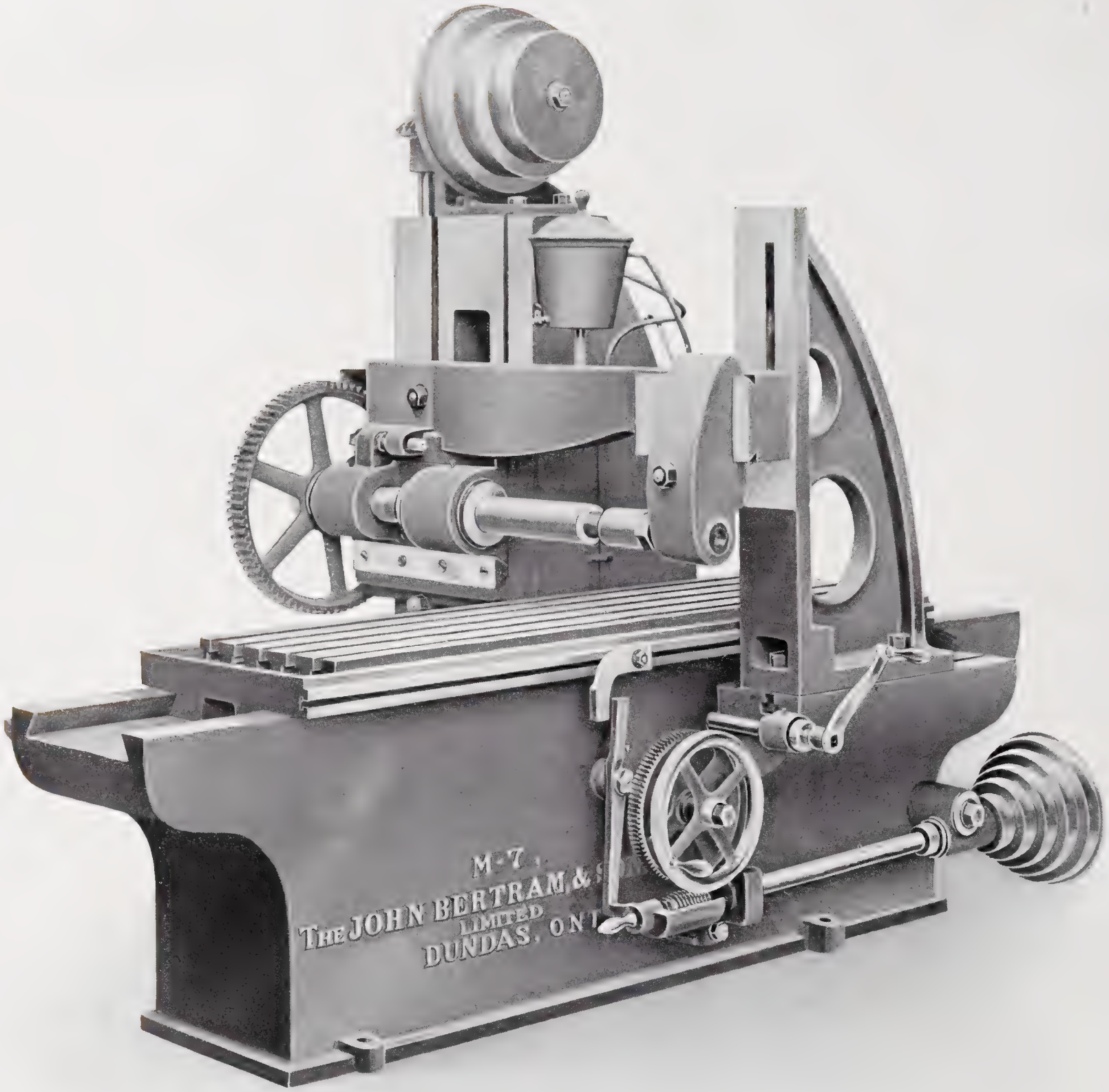
No. 6 PLAIN MILLING MACHINE

34 x 8 x 20 INCHES

No. M-6

THE table has an automatic longitudinal feed of 34 inches, a transverse movement of 8 inches, and can be lowered 20 inches from center of spindle.

Code-Word . . . . . GRAXEAREM
Code-Word, with power cross and vertical feeds . . . . . GRAYER



No. 7 MILLING MACHINE

WIDTH between uprights, 22 inches. Greatest distance from center of spindle to table, 20 inches. Width of table, 20 inches. Cutters up to 8 inches in diameter can be used on this machine. The bearing for the cutter-mandrel is adjustable on the crossrail and raises and lowers with the spindle. If so ordered, one of the uprights may be arranged to move back parallel to the table so as to permit end milling of long pieces. The table has variable power-feed in both directions and quick power-traverse as well as rapid and fine hand-adjustment.

Code-Word . . . . . GRAYBACK
Code-Word, for direct-connected motor . . . . . ICEBERG

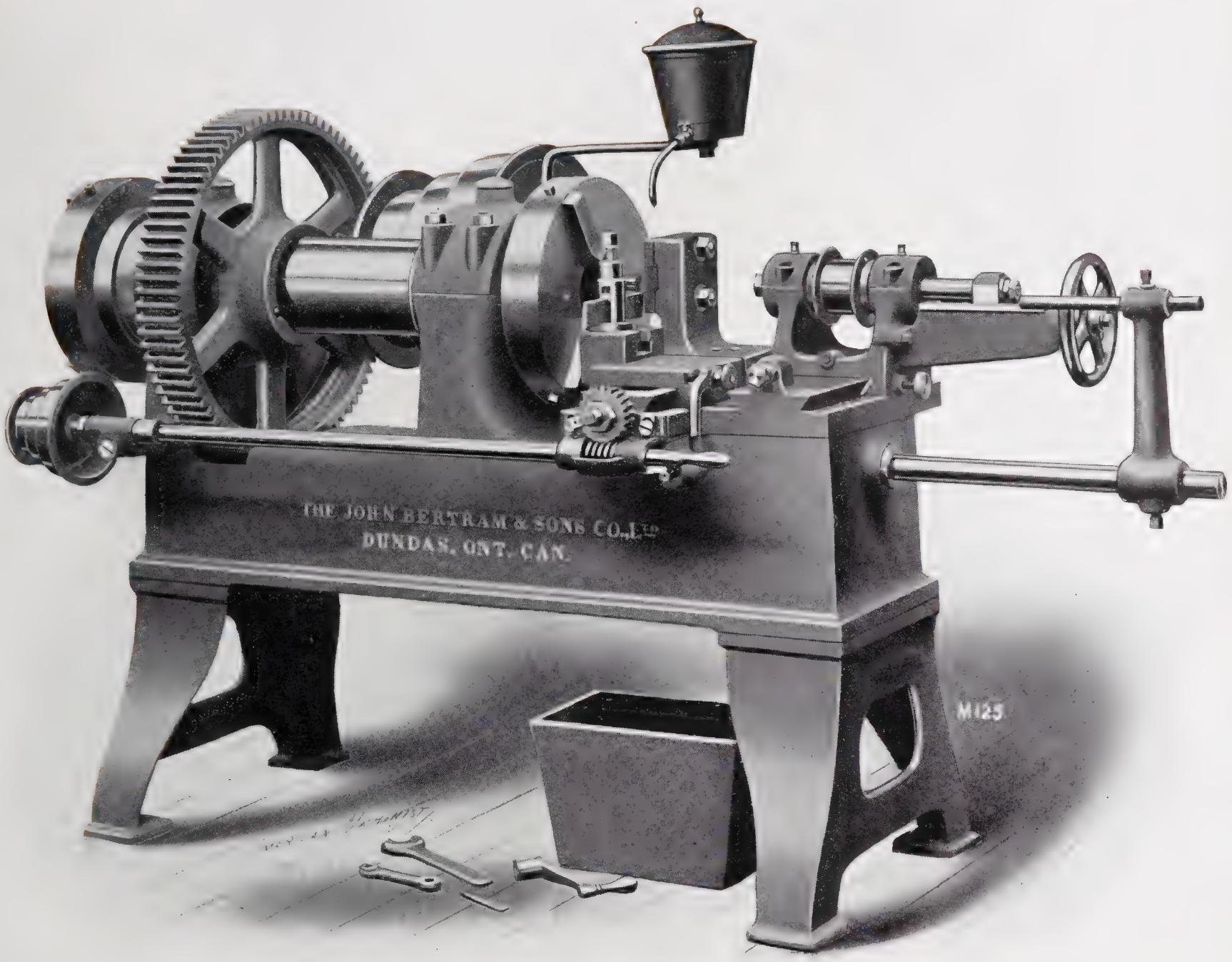
CUTTING-OFF MACHINES

CUTTING-OFF AND CENTERING MACHINES

THESE machines are made in three sizes, having automatic feed, stop-motion and adjustable-gauge, which can be quickly and easily set for different lengths of shafts. A hollow spindle having a universal chuck at each end, holds the bar or pipe to be cut off. The cross-slide carries two cutting-off tool-holders in which the cutting-blades can be secured and released quickly. One tool presses up and the other down, which relieves the strain and leverage on the chucks and bearings. The centering-head has a revolving spindle driven from separate countershaft, and can be moved quickly in or out of position.

DIMENSIONS

No. of Machine	Maximum Size it will Cut	Minimum Size it will Cut	Length of Bed	Countershaft-Pulleys for Driving		Code-Word
				Dimensions	Revolutions	
	Inches	Inches	Feet	Inches		
123	[illegible]	1	5	18 x 5	120	GAMONES
124	[illegible]	[illegible]	5	14 x 5	80	GAMONS
[illegible]	5	2	5	18 x 7	106	GAMOTE
126	7	[illegible]	5	24 x 7	100	GAMPHER



CUTTING-OFF AND CENTERING MACHINE

2 TO 5 INCHES

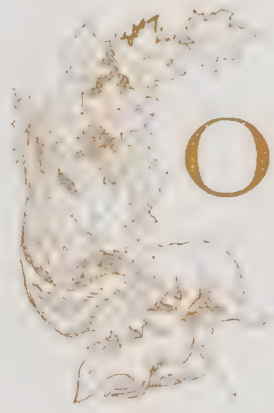
No. M-125

THIS machine cuts off and centers rough stock from 2 to 5 inches in diameter. The spindle is of cast iron, and has a universal chuck at each end. The feed has three changes and automatic-stop. The centering-attachment is fitted to the cross-slide and when not in use is moved back to clear the stop-gauge. The countershaft has fast and loose pulleys 18 inches in diameter for 6-inch belt, and should make 106 revolutions per minute.

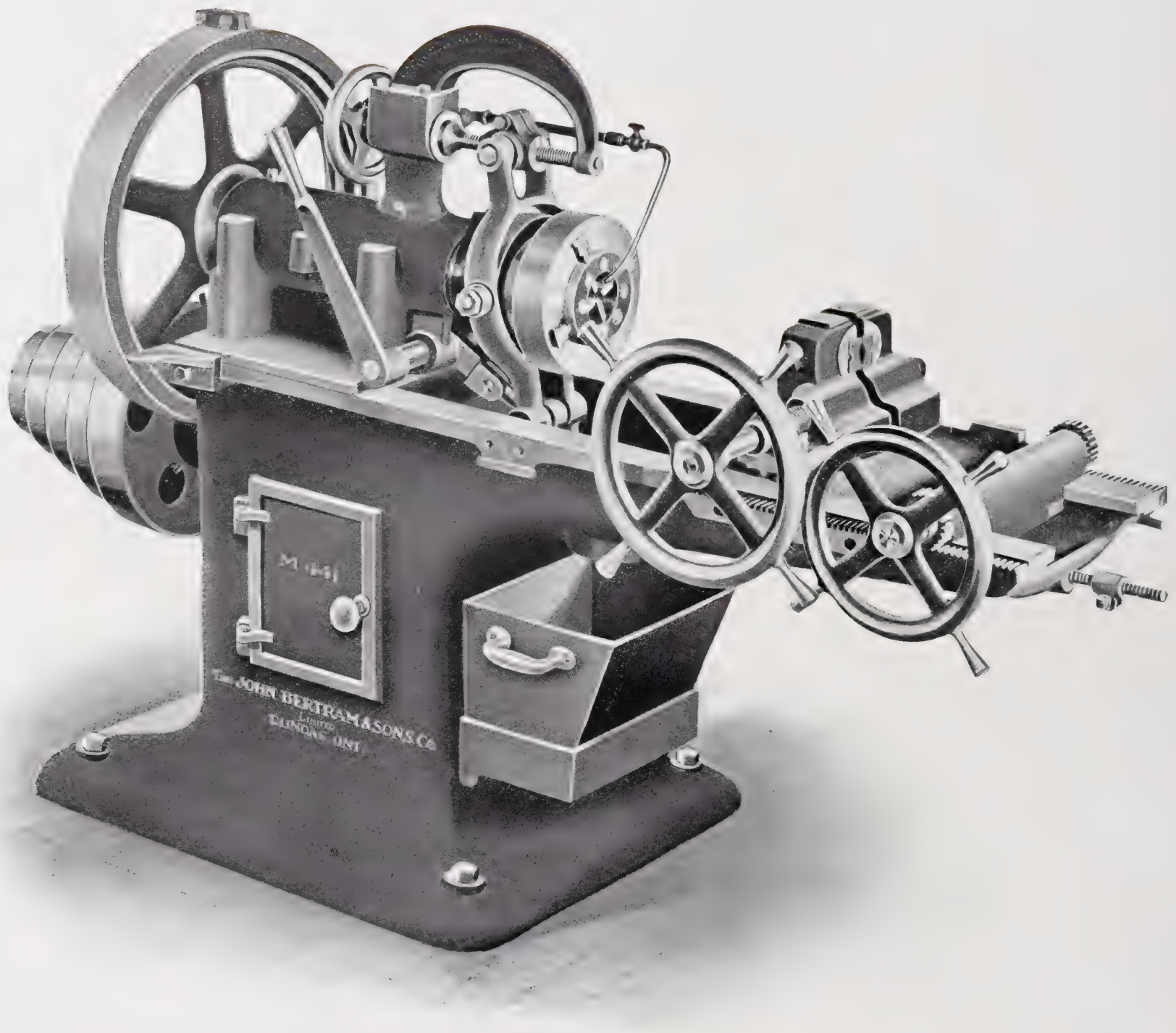
Code-Word GAMOTE

BOLT-CUTTING AND NUT-TAPPING MACHINERY

BOLT CUTTING AND NUT TAPPING MACHINERY



ON the following pages we illustrate a line of bolt-threading and nut-tapping machinery, consisting of single, double, triple and quadruple bolt-threading machines for all purposes, capable of threading bolts from ¼ to 4 inches in diameter in single-head machines,—in double, triple and quadruple machines bolts from ¼ to 2 inches in diameter; nut-tapping machines having four and six spindles, capable of tapping from ⅛ to 2-inch nuts. In designing these machines special attention has been paid to the convenience in handling, and parts subject to wear are made of case-hardened steel.



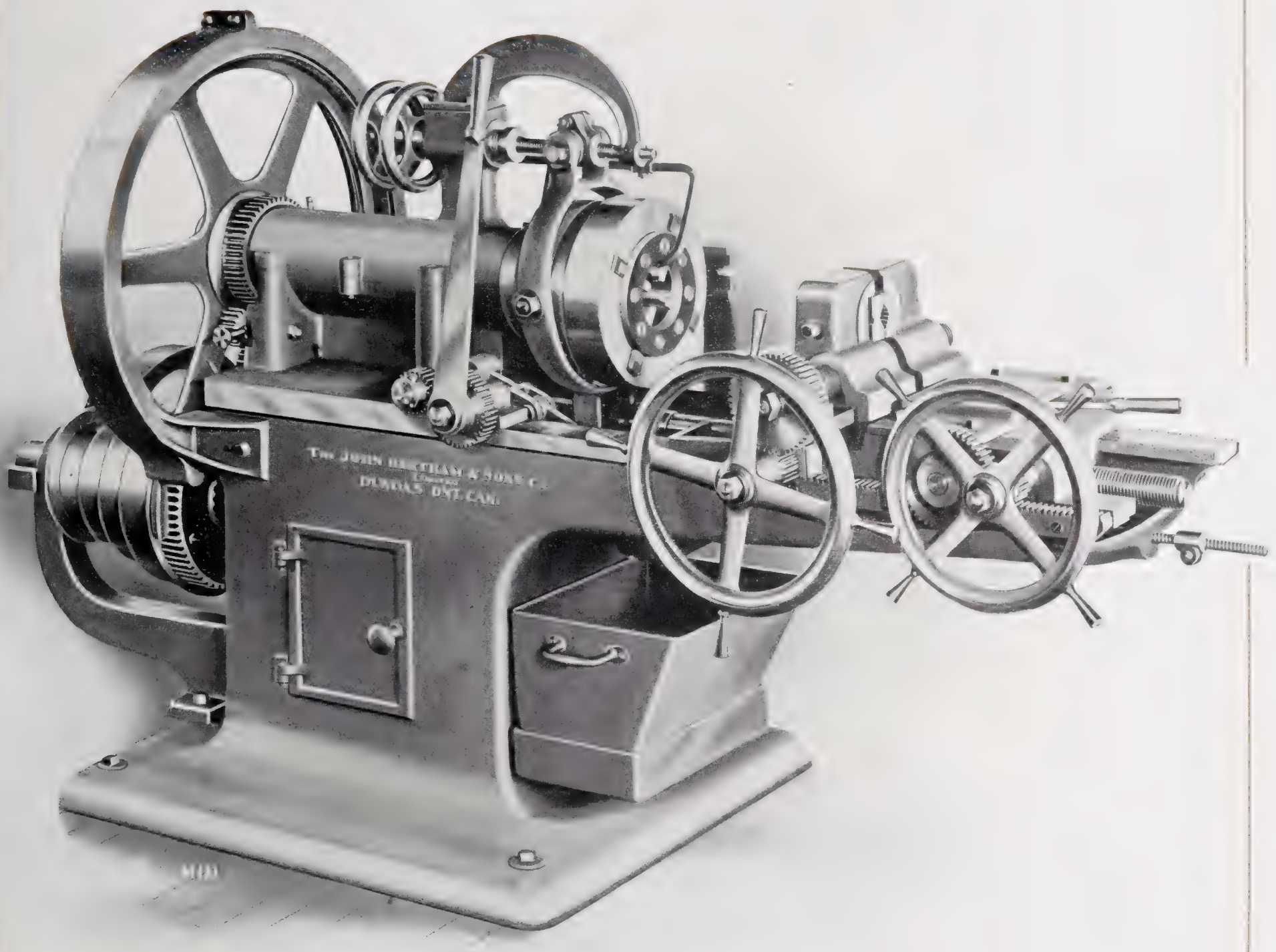
1½-INCH SINGLE BOLT CUTTER

ACME TYPE

No. M-121

THIS machine is suitable for threading bolts from ⅜ to 1½ inches, either right or left hand. The spindle is hollow so that any length of thread can be cut. When so ordered the carriage can be equipped with leadscrew, having power-feed for cutting special work. This machine is supplied with 9 sets of cap-dies from ½ to 1½ inches, 9 nut-taps as per dies, and tap-holder. The countershaft has fast and loose pulleys 16 inches in diameter for 4-inch belt, speed 225 revolutions per minute.

Code-Word . . . . . FRUSCIO



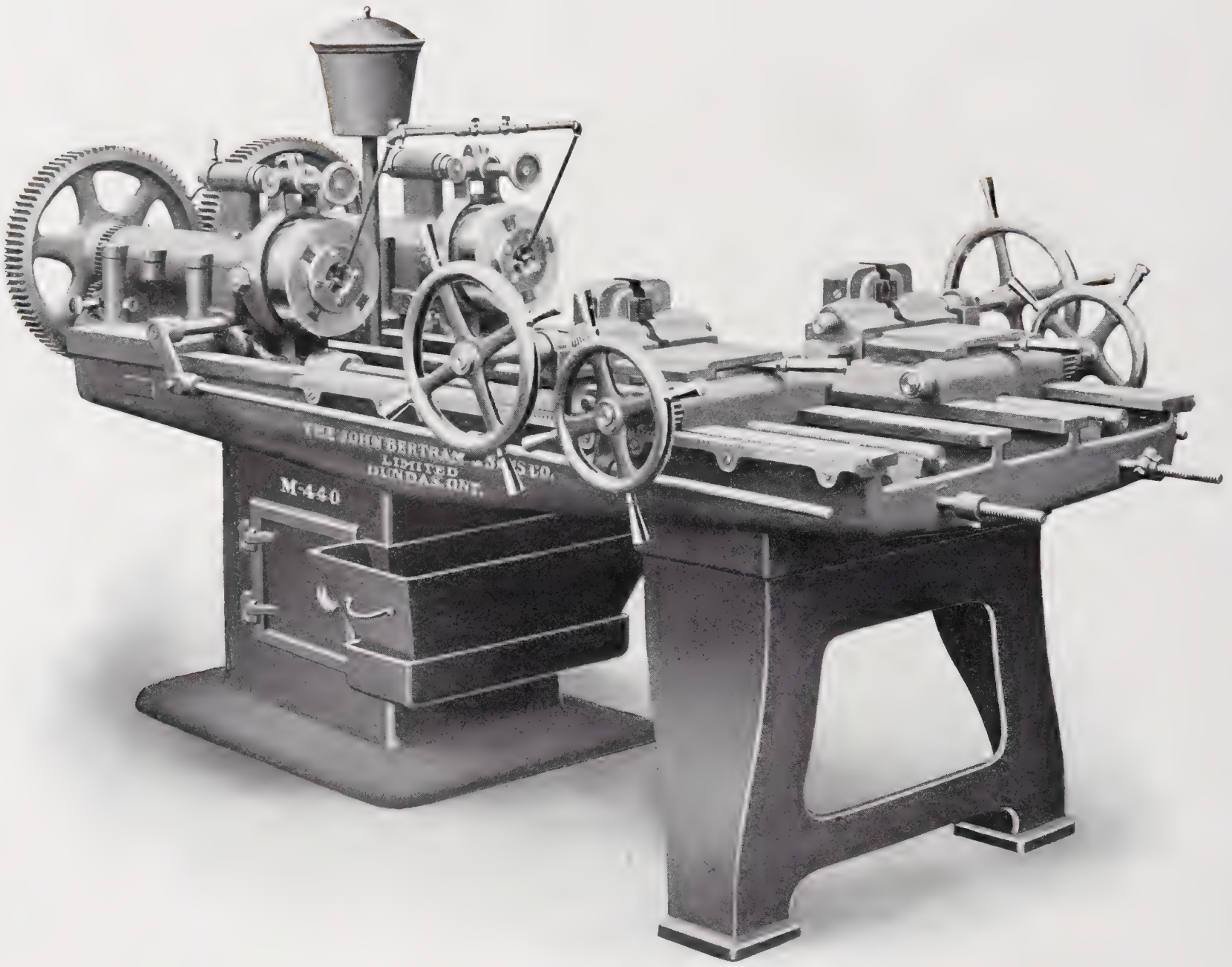
3-INCH SINGLE BOLT CUTTER

ACME TYPE

No. M-131

THIS machine is suitable for threading bolts from [illegible] inches, either right or left hand. The spindle is hollow so that any length of thread can be cut. When so ordered the carriage can be equipped with leadscrew having power-feed for cutting special work. The machine is supplied with 13 sets of dies, 13 nut-taps and tap-holder. The countershaft has fast and loose pulleys 16 inches in diameter for 4-inch belt, speed 225 revolutions per minute.

Code-Word [illegible]



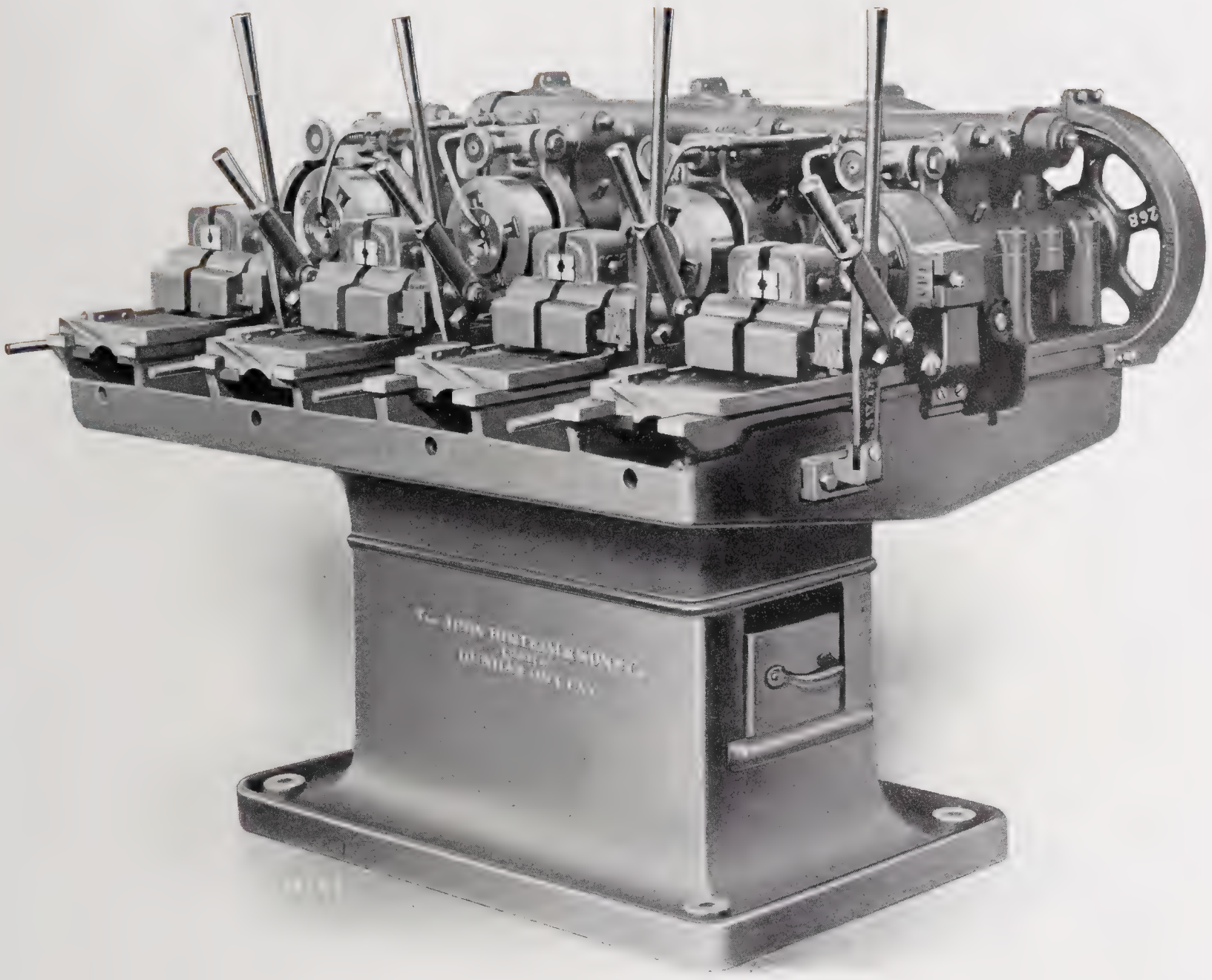
1½-INCH DOUBLE STAY BOLT CUTTER

ACME TYPE

No. M-440

THIS machine is designed for Locomotive and Marine Boiler Shops and when equipped with leadscrew attachment will thread at one time two stay bolts 36 inches long of absolutely correct pitch. Each head is provided with automatic-stop and die-opening attachment. The countershaft has fast and loose pulleys 16 inches in diameter for 4-inch belt, speed 225 revolutions per minute.

Code-Word . . . . . FRUSLERA



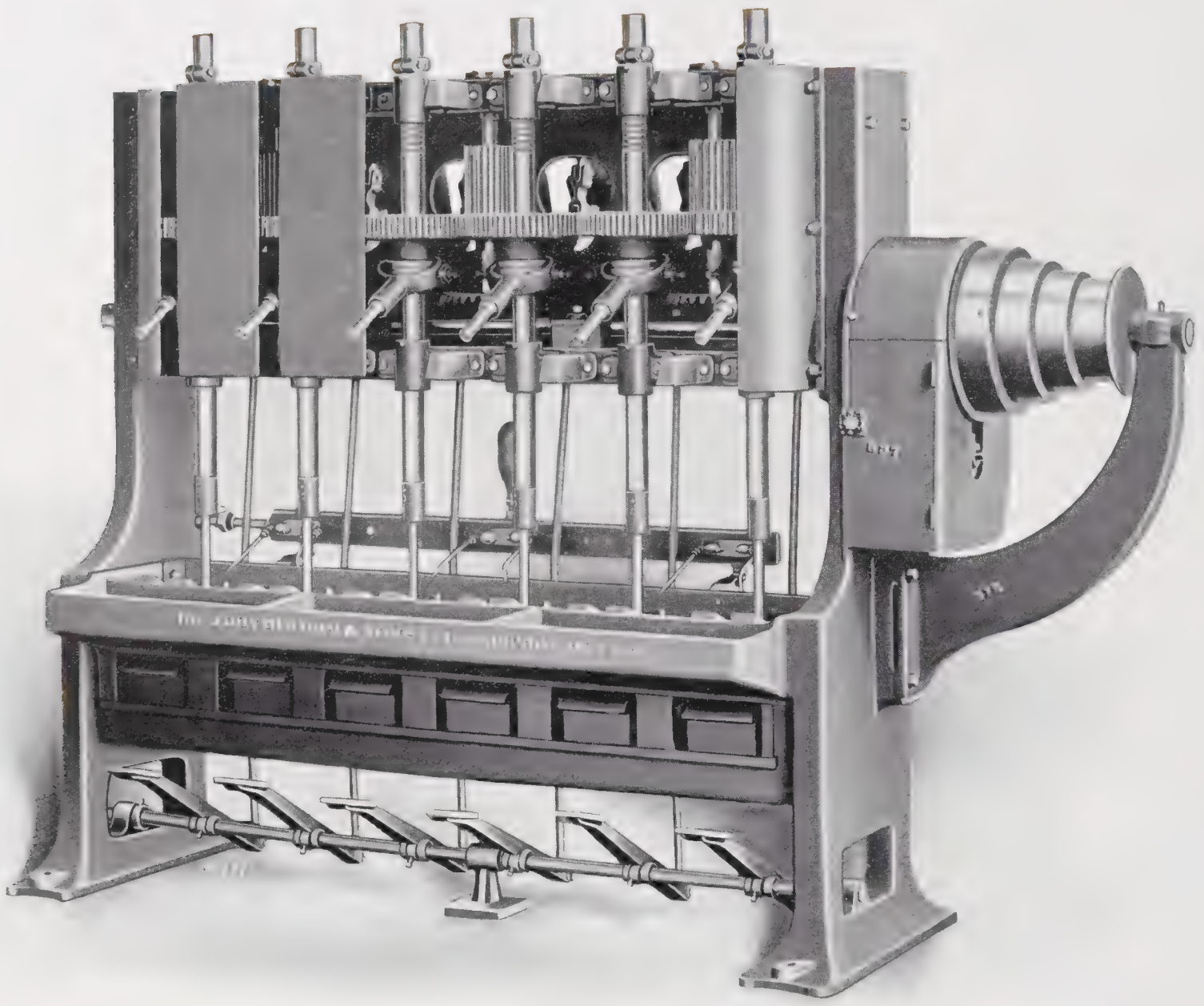
1½-INCH QUADRUPLE BOLT CUTTER

ACME TYPE

No. M-145

THIS machine is designed specially for manufacturing purposes to produce as large a quantity of work as it is possible for a single operator to handle, and to accomplish this, each carriage has an automatic motion. When the bolt has been threaded the desired length the dies open automatically and the bolt is withdrawn by bringing the carriage back. The dies by the same motion are closed. The countershaft has fast and loose pulleys 16 inches in diameter for 4-inch belt, speed 160 revolutions per minute.

Code-Word . . . . . FRUSTABAM



2-INCH SIX-SPINDLE BACK-GEARED NUT TAPPER

ACME TYPE

No. M-207

SUITABLE for tapping ½ to 2-inch either square or hexagon nuts. The machine has adjustable nut-holders and quick-acting sockets. Taps can be removed and replaced while the machine runs at full speed, or each spindle may be stopped at will. The spindles are counterbalanced to prevent the breaking of taps. Each pair of spindles run at different speeds, but can be arranged to run at one speed if desired.

Code-Word . . . . . HONENDE

PUNCHING AND SHEARING MACHINERY

PUNCHING AND SHEARING MACHINES

THESE machines are built in various sizes and capacities, either double or single in form, with throats of any depth between 5 and 72 inches. In the double machines the respective sides are entirely independent of each other; both ends may be engaged for punching or shearing, or one end for punching and the other end for shearing. The capacity of the machines varies according to size, and the throats of the same size vary in depth as shown by the tables on the following pages. Single machines are furnished with one set of punching tools or a pair of crosscut or splitting shears, and the double machines with a set of tools, punches or shears, for each side. Special punches and shears for angles and special shapes may be used on any of our regular machines. These machines may be driven to advantage by direct-connected motors.

DIMENSIONS

No. 1 M-273 PUNCH AND SHEAR.

Depth of Throat	Punching Capacity: Diam. of Hole	Punching Capacity: Thickness of Material	Shearing Capacity: Plates	Shearing Capacity: Flat Bars	Shearing Capacity: Round Bars	Code-Words: Single Machine	Code-Words: Double Machine
5 Inches	5/8 Inch	1/2 Inch	3/8 Inch	3 1/2 x 1/2 Inch	1 Inch	HERCLAN	HERCYNA
[illegible]	[illegible]	[illegible]	3/8 "	3 1/2 x 1/2 "	1 "	HERCLE	HERCYNEAN
12 "	5/8 "	[illegible]	5/16 "	3 1/2 x 3/8 "	7/8 "	HERCOCERAS	HERCYNIAE
16 "	5/8 "	[illegible]	5/16 "	[illegible]	7/8 "	HERCOGAMY	HERCYNITE
20 "	1/2 "	7/16 "	[illegible]	3 1/2 x 5/16"	3/4 "	[illegible]	HERCYNIUS
[illegible]	1/2 "	[illegible]	1/4 "	3 1/2 x 5/16"	3/4 "	HERCTA	HERDACHT

No. 2 M-278 PUNCH AND SHEAR

6 Inches	7/8 Inch	5/8 Inch	1/2 Inch	3 1/2 x 5/8 Inch	1 1/8 Inches	HERDADA	HERDEIRO
9	5/8	5/8 "	1/2 "	3 1/2 x 5/8 "	[illegible] "	HERDAGEN	HERDEISEN
12 "	[illegible]	7/16 "	[illegible]	3 1/2 x 5/8 "	1 1/8 "	HERDAGENDE	HERDEKKE
16 "	[illegible]	1/2 "	7/16 "	3 1/2 x 1/2 "	[illegible]	HERDAM	HERDEKKING
20 "	[illegible]	7/16 "	3/8 "	[illegible]	1 Inch	HERDAMPFEN	HERDEN
[illegible]	5/8 "	[illegible]	5/16 "	3 1/2 x 3/8 "	7/8 "	HERDANCA	[illegible]

No. 3 M-271 PUNCH AND SHEAR

8 Inches	7/8 Inch	7/8 Inch	5/8 Inch	4 x 3/4 Inch	1 3/8 Inches	HERDENLOS	HERDKUH
12 "	[illegible]	3/4 "	5/8 "	4 x 3/4 "	[illegible]	HERDENREICH	HERDLINGES
[illegible]	[illegible]	5/8 "	1/2 "	4 x 5/8 "	1 1/4 "	HERDENVOLL	HERDLOFFEL
[illegible]	[illegible]	5/8 "	[illegible]	4 x 1/2 "	1 1/8 "	HERDERIE	HERDMAN
[illegible]	11/16 "	1/2 "	7/16 "	4 x 1/2 "	[illegible]	[illegible]	HERDMAUER
[illegible]	[illegible]	[illegible]	[illegible]	4 x 3/8 "	1 Inch	HERDERLIJK	HERDEON

No. 4 M-272 PUNCH AND SHEAR

8 Inches	1 1/8 Inches	7/8 Inch	3/4 Inch	4 1/2 x 1 Inch	1 1/2 Inches	HERDOENING	HEREDAD
12 "	[illegible]	7/8 "	11/16 "	4 1/2 x 1 "	[illegible]	HERDONNERN	HEREDAIS
18 "	7/8 Inch	3/4 "	5/8 "	4 1/2 x 7/8 "	1 3/8	[illegible]	HEREDARES
21 "	7/8 "	5/8 "	[illegible]	[illegible]	1 1/4 "	HERDOOPING	HEREDEN
25	1	5/8 "	5/8 "	4 1/2 x 7/8 "	[illegible]	HERDORF	HEREDIA
[illegible]	7/8 "	1/2 "	7/16 "	[illegible]	[illegible]	HERDORSCHE	HEREDITAS
[illegible]	3/4 "	[illegible]	3/8 "	4 1/2 x 1/2 "	1 Inch	HERDORTE	HEREDIUM

No. 5 M-269 PUNCH AND SHEAR

12 Inches	1 1/8 Inches	1 Inch	7/8 Inch	6x1 1/8Inches	1 3/4 Inches	HEREDUM	HEREMIET
16	1 Inch	7/8 "	7/8 "	6 x 1 1/8 "	1 3/4 "	HEREENDE	HEREMITA
20	1	3/4 "	3/4 "	6 x 1 Inch	1 1/2 "	[illegible]	HEREN
25	[illegible]	7/8 "	3/4 "	6 x 1	1 1/2 "	HEREENENDE	HERENCIA
[illegible]	1	[illegible]	3/4	6 x 3/4 "	1 1/4 "	HEREENIGD	HERENNIO
36 "	1 "	3/4 "	[illegible]	6 x 3/4 "	[illegible]	HEREENIGEN	HERENTEN
42 "	[illegible]	[illegible]	5/8 "	[illegible]	1 1/8 "	HEREETEN	HEREOUT
48	[illegible]	5/8 "	[illegible]	6 x 5/8 "	1 1/8 "	HEREGDE	HERESIA

DIMENSIONS

No. 6 M-271 PUNCH AND SHEAR

Punching Capacity			Shearing Capacity		Code Words	
Depth of Throat	Diam. of Hole	Thickness of Material	Plates	Flat Bars	Round Bars	Single Machine	Double Machine
12 Inches	2 Inches	1 Inch	1 Inch	6 x 1½ Inches	2 Inches	HERESIARCH	HERFSTEN
16 "	2	1 "	1 "	6 x 1½ "	2	[illegible]	[illegible]
20 "	[illegible]	[illegible]	1 "	6 x 1¼ "	1¾ "	HERESIES	HERFSTWERK
[illegible]	[illegible]	1 "	[illegible]	6 x 1¼ "	1¾ "	HERESY	[illegible]
[illegible]	1½ "	1 "	1 "	6 x 1⅛ "	1½ "	HERETE	HERFUHLEN
[illegible]	[illegible]	[illegible]	1 "	6 x 1⅛ "	1½ "	HERETIC	HERFUHRST
42 "	[illegible]	⅞ "	⅞ "	6 x 1 Inch	1½ "	HERETICABA	HERFURER
[illegible]	1 Inch	[illegible]	[illegible]	[illegible]	1½ "	HERETICADO	HERFURGANG
54 "	⅞ "	⅝ "	⅝ "	6 x ¾	⅞ Inch	HERETICAL	HERFURHEBE

No. 7 M-275 PUNCH AND SHEAR

15 Inches	2 Inches	1¼ Inches	1¼ Inches	8 x 1½ Inches	2¼ Inches	[illegible]	HERGEVEN
20 "	1¾ "	1¼ "	1¼ "	8 x 1½ "	2¼ "	[illegible]	HERGEWALZT
25 "	1¾ "	1⅛ "	1⅛ "	8 x 1¼ "	2⅛ "	HERFURWAGE	HERGEWINKT
[illegible]	1½ "	1 Inch	1 Inch	8 x 1⅛	2	HERFURWARF	HERGEZEIGT
[illegible]	1¼ "	[illegible]	[illegible]	8 x 1 Inch	2 "	HERFURZOG	HERGIET
42 "	1½	[illegible]	[illegible]	8 x 1⅛ Inches	[illegible]	HERGAAN	HERGIETEN
48 "	1¼ "	[illegible]	[illegible]	8 x 1 Inch	[illegible]	HERGABE	HERGOOT
54 "	1⅛	⅞ "	⅞ "	8 x 1	[illegible]	HERGAF	HERGOTEN
60 "	1 Inch	¾ "	¾ "	8 x ¾ "	1¼ "	HERGAFFEN	HERGREEP

No. 8 M-276 PUNCH AND SHEAR

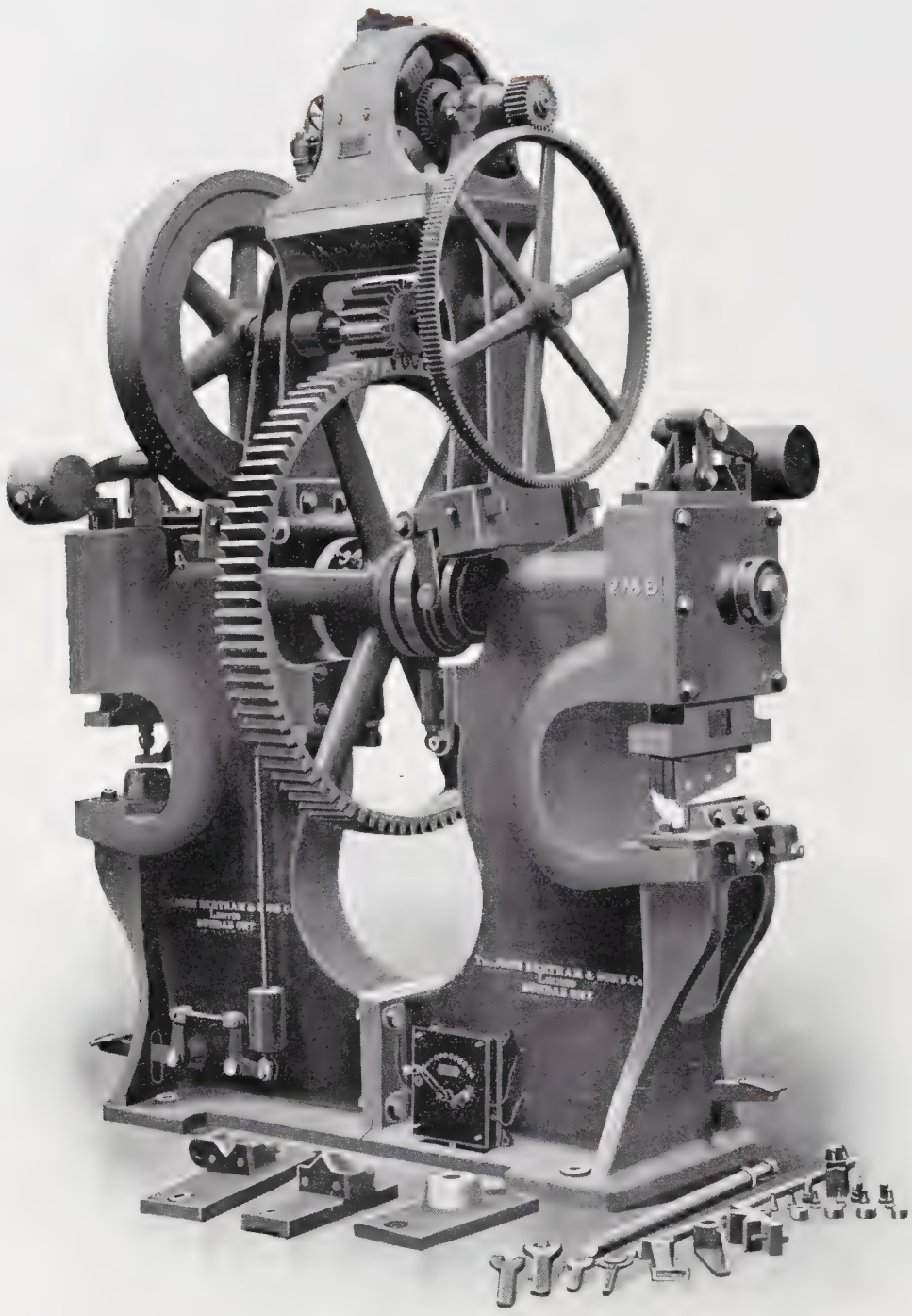
15 Inches	2¼ Inches	1⅜ Inches	1⅜ Inches	10 x 1¾ Inches	2½ Inches	HERGRINSEN	HERICIAN
25 "	2	1¼ "	1¼ "	[illegible]	2½ "	HERGROEIEN	HERICINUS
[illegible]	2¼ "	[illegible]	1¼ "	[illegible]	[illegible]	HERGRONDEN	HERICIORUM
[illegible]	2 "	1¼ "	1¼ "	10 x 1¼ "	2⅛ "	HERGUCKEN	HERICOURT
42 "	2	1⅛ "	1⅛ "	10 x 1¼ "	2 "	HERHAALD	HERIDA
48 "	1¾ "	1⅛ "	1⅛ "	10 x 1¼	[illegible]	HERHAALTE	HERIDELLE
54 "	1¾ "	1⅛ "	[illegible]	10 x 1¼ "	1¾ "	HERHABEN	HERIDERA
60 "	[illegible]	1 Inch	1 Inch	10 x 1⅛ "	[illegible]	HERHAKKEN	HERIDO
66 "	1½ "	[illegible]	1 "	10 x 1 Inch	1½ "	HERHALEN	HERIDORA
72 "	[illegible]	[illegible]	1 "	10 x 1 "	[illegible]	HERHALENDE	HERIEDAIS

No. 9 M-270 PUNCH AND SHEAR

16 Inches	2½ Inches	1½ Inches	1½ Inches	10 x 2 Inches	3 Inches	HERIEDEIS	HERITA
25 "	2½ "	[illegible]	[illegible]	10 x 2	3	HERIEDO	HERITABLE
[illegible]	2¼ "	1⅜ "	1½ "	10 x 2	2¾ "	HERIFUGA	HERITAGE
[illegible]	2¼ "	[illegible]	1½ "	[illegible]	2⅝ "	HERIFUGAM	HERITAIENT
42 "	2	[illegible]	1½ "	10 x 1¾ "	2½ "	HERIFUGIS	HERITAIS
48 "	[illegible]	1¼ "	[illegible]	10 x 1½ "	[illegible]	HERIGOTE	HERITANCE
[illegible]	1¾ "	[illegible]	1¼ "	10 x 1½ "	[illegible]	HERIGOTURE	HERITANT
60 "	[illegible]	1¼ "	1¼ "	10 x 1¼ "	2⅛ "	HERIJK	HERITASSE
66 "	[illegible]	1⅛ "	1⅛ "	10 x 1⅛ "	[illegible]	HERIJKEN	HERITATES
72 "	1½	1 Inch	1⅛ "	10 x 1 Inch	1¾ "	HERIJKING	HERITER

No. 10 M-277 PUNCH AND SHEAR

18 Inches	3 Inches	2 Inches	2¼ Inches	10 x 2½ Inches	4½ Inches	HERITERAS	HERKEURT
[illegible]	3 "	[illegible]	2	10 x 2 "	3½ "	HERITERENT	HERKEUZE
60 "	2½ "	[illegible]	[illegible]	10 x 1¾	[illegible]	HERITEREZ	HERKIEST
72 "	[illegible]	[illegible]	[illegible]	10 x 1½ "	2⅛ "	HERITERONS	HERKIEZEN



No. 1 DOUBLE PUNCHING AND SHEARING MACHINE

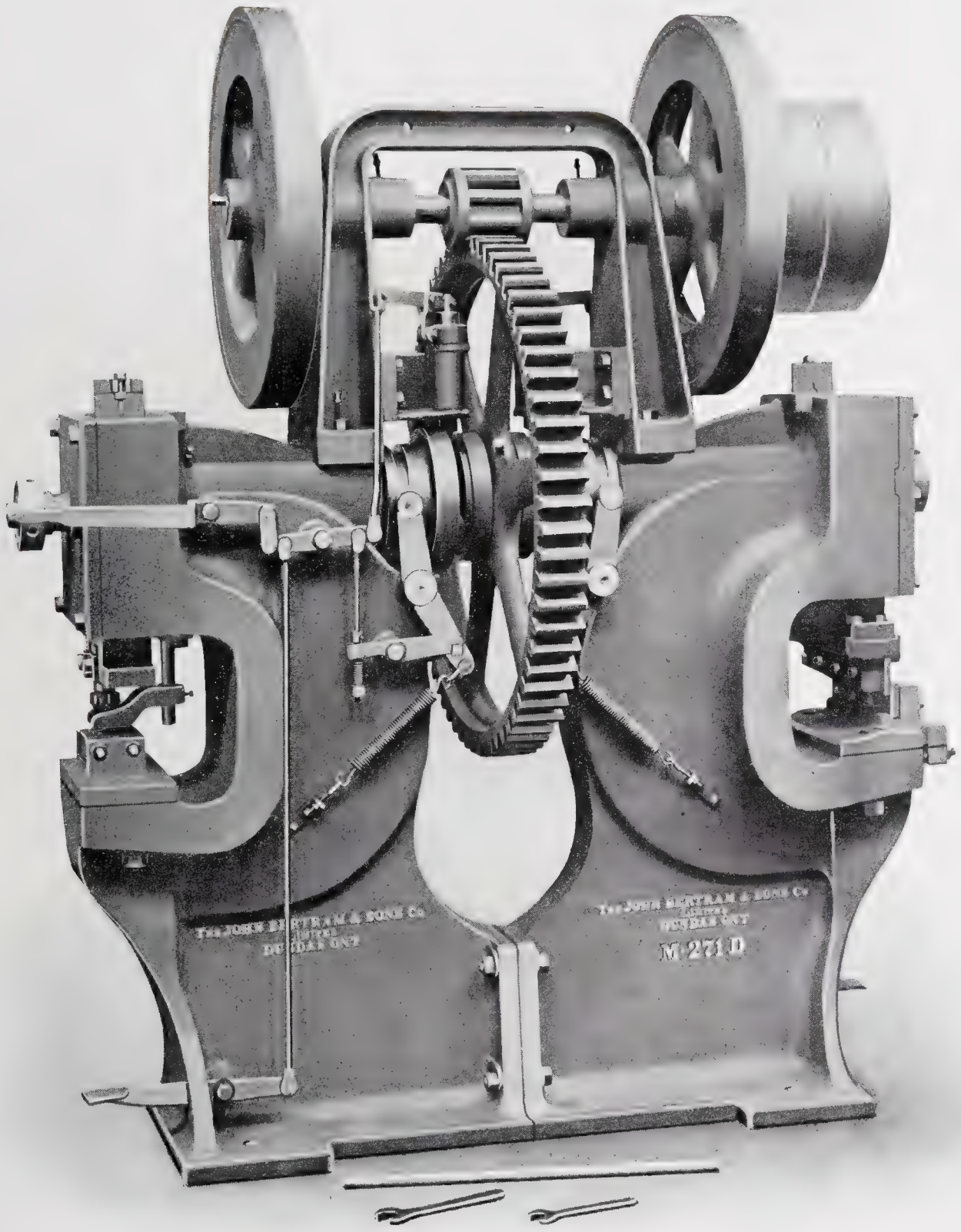
MOTOR DRIVEN

No. M-273 B

FOR general purpose punching and shearing. Built with varied depths of throats ranging from 5 to 25 inches. The two sides run independently of each other and are operated by steel-faced clutches under control of foot-treadle.

See tabulated lists for capacity of machine and depths of throats.

Code-Word, with 5-inch depth of throat, belt driven	HERCYNA
Code-Word, for direct-connected motor.	[illegible]



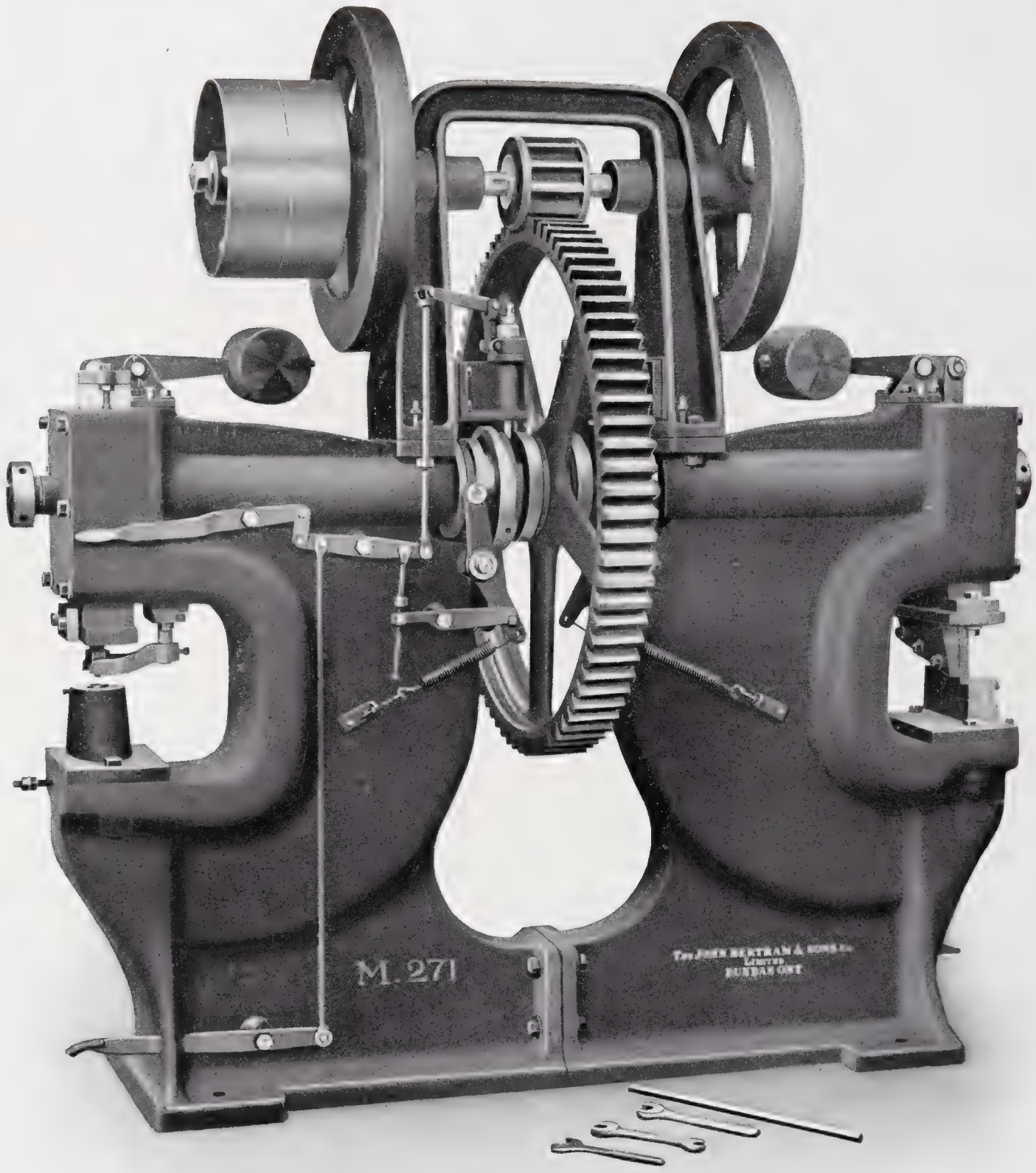
No. 2 DOUBLE PUNCHING AND SHEARING MACHINE

No. M-278 D

For general purpose punching and shearing. Built with varied depths of throats ranging from 6 to 25 inches. We build this machine with throats the same depth on both sides as shown, or shallow on one side and deep on the other. Punching-tools, crosscut or splitting shears can be used on either side of the machine.

See tabulated lists for capacity of machine and depths of throats.

Code-Word, with 6-inch depth of throat, belt driven . . HERDEIRO
Code-Word, for direct-connected motor . . . . . ICEBERG



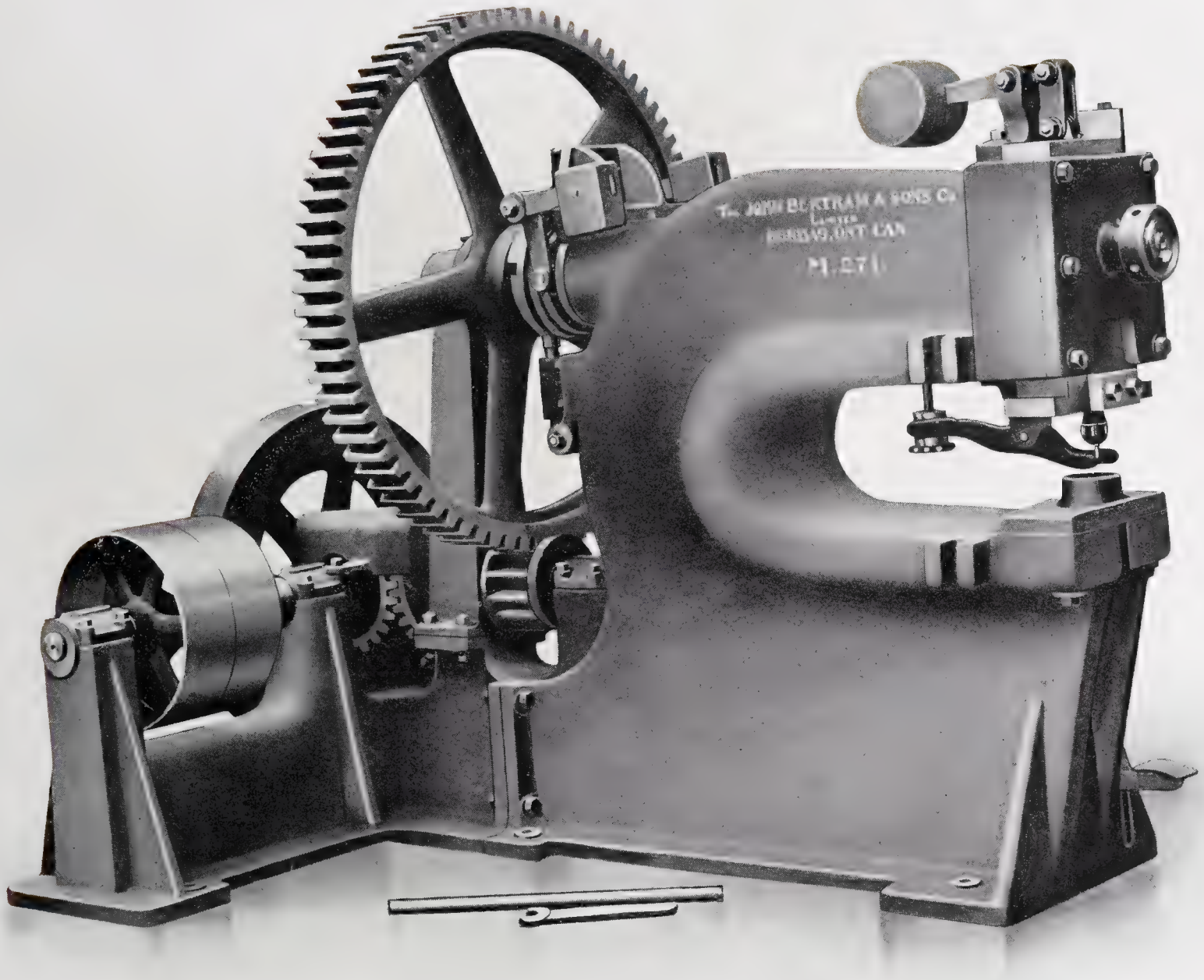
No. 3 DOUBLE PUNCHING AND SHEARING MACHINE

No. M-271

FOR general purpose punching and shearing. Built with varied depths of throats ranging from 8 to 30 inches. The two sides run independently of each other, and will receive punching-tools, crosscut or splitting shears. The machine can be driven by tight and loose pulleys as shown, or direct-connected motor.

See tabulated lists for capacity of machine and depths of throats.

Code-Word, with 8-inch depth of throat, belt driven . . . . . HERDKUH
Code-Word, for direct-connected motor . . . . . ICEBERG



No. 3 SINGLE PUNCHING OR SHEARING MACHINE

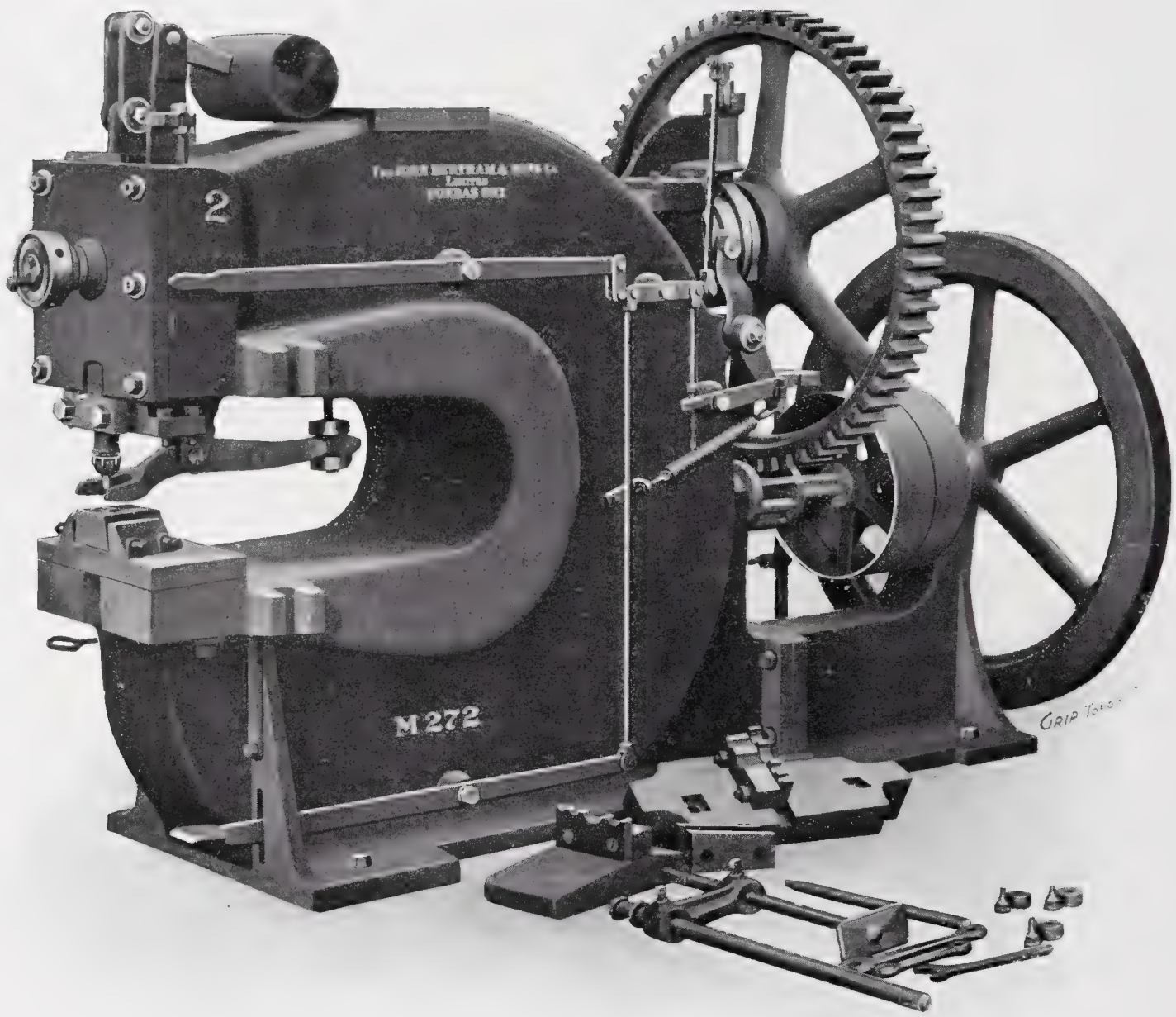
WITH RIGHT ANGLE DRIVE

No. M-271

FOR general purpose punching or shearing. Built with varied depths of throat ranging from 8 to 30 inches. Equipped with automatic-stop, and adjustable punch and die holder.

See tabulated lists for capacity of machine and depths of throat.

Code-Word, for right angle drive	HERKOKEN
Code-Word, with fixtures for both punching and shearing	[illegible]
Code-Word, for direct-connected motor.	ICEBERG



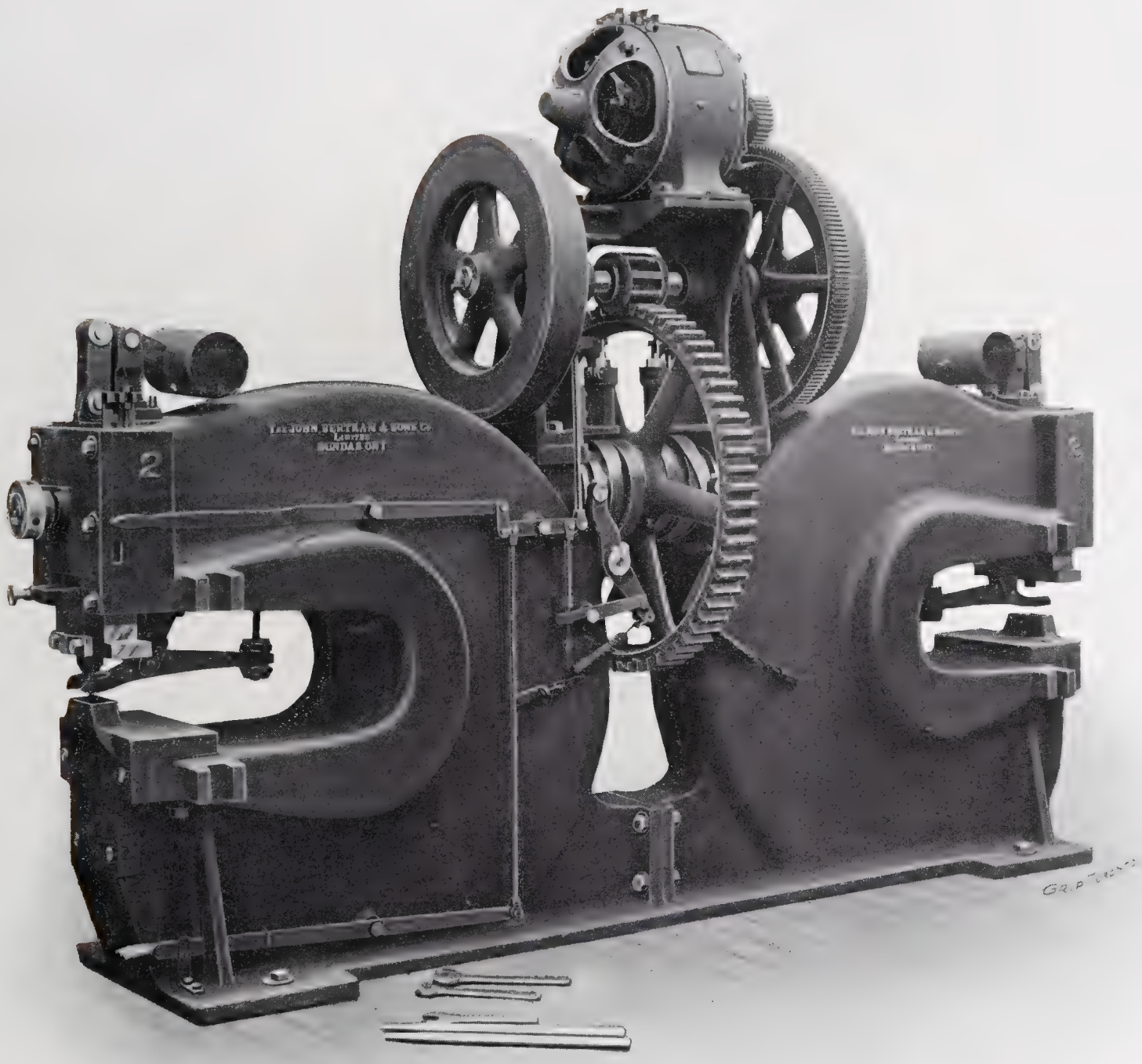
No. 4 SINGLE PUNCHING OR SHEARING MACHINE

No. M-272

For general purpose punching or shearing. Built with varied depths of throat ranging from 8 to 36 inches. Equipped with automatic-stop, also adjustable punch and die holder, crosscut or splitting shears. The illustration shows jaws arranged for boiler maker's use, but the machine can be arranged for structural iron work when so ordered.

See tabulated lists for capacity of machine and depths of throat.

Code-Word, with 8-inch depth of throat, belt driven . . . . . HERDOENING
Code-Word, with fixtures for both punching and shearing . . . . . HERDSAU
Code-Word, for direct-connected motor . . . . . ICEBERG



No. 4 DOUBLE PUNCHING AND SHEARING MACHINE

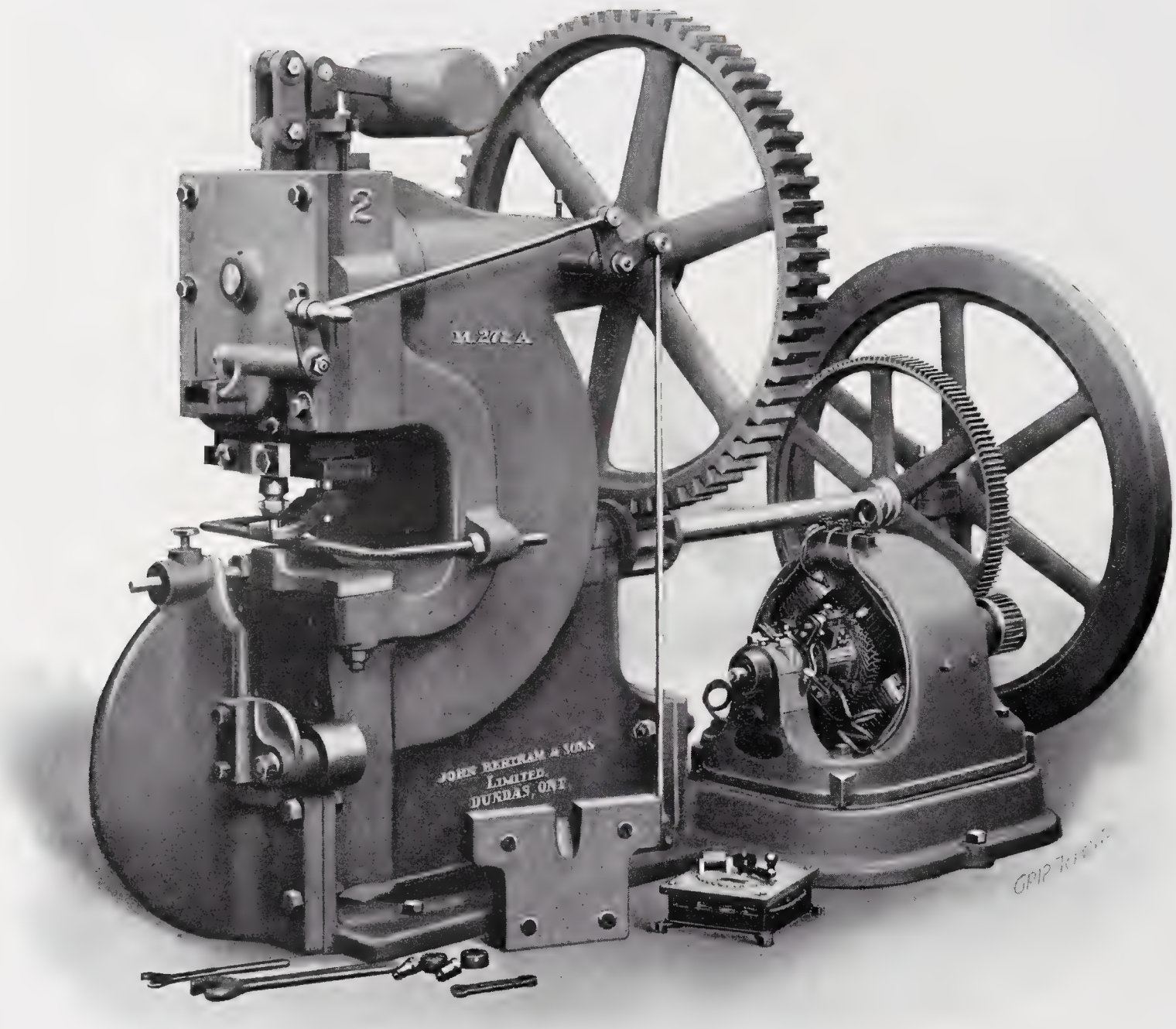
MOTOR DRIVEN

No. M-272

FOR general purpose punching and shearing. With throats of uniform depth and punching-tools on both sides. Equipped with automatic-stop and adjustable punch and die holder. The illustration shows jaws specially designed for punching angles, channels and beams either in the flange or web, also flange of boiler-heads.

See tabulated lists for capacity of machine and depths of throats.

Code-Word, with 8-inch depth of throat, belt driven . . . . . HEREDAD
Code-Word, for direct connected-motor . . . . . ICEBERG



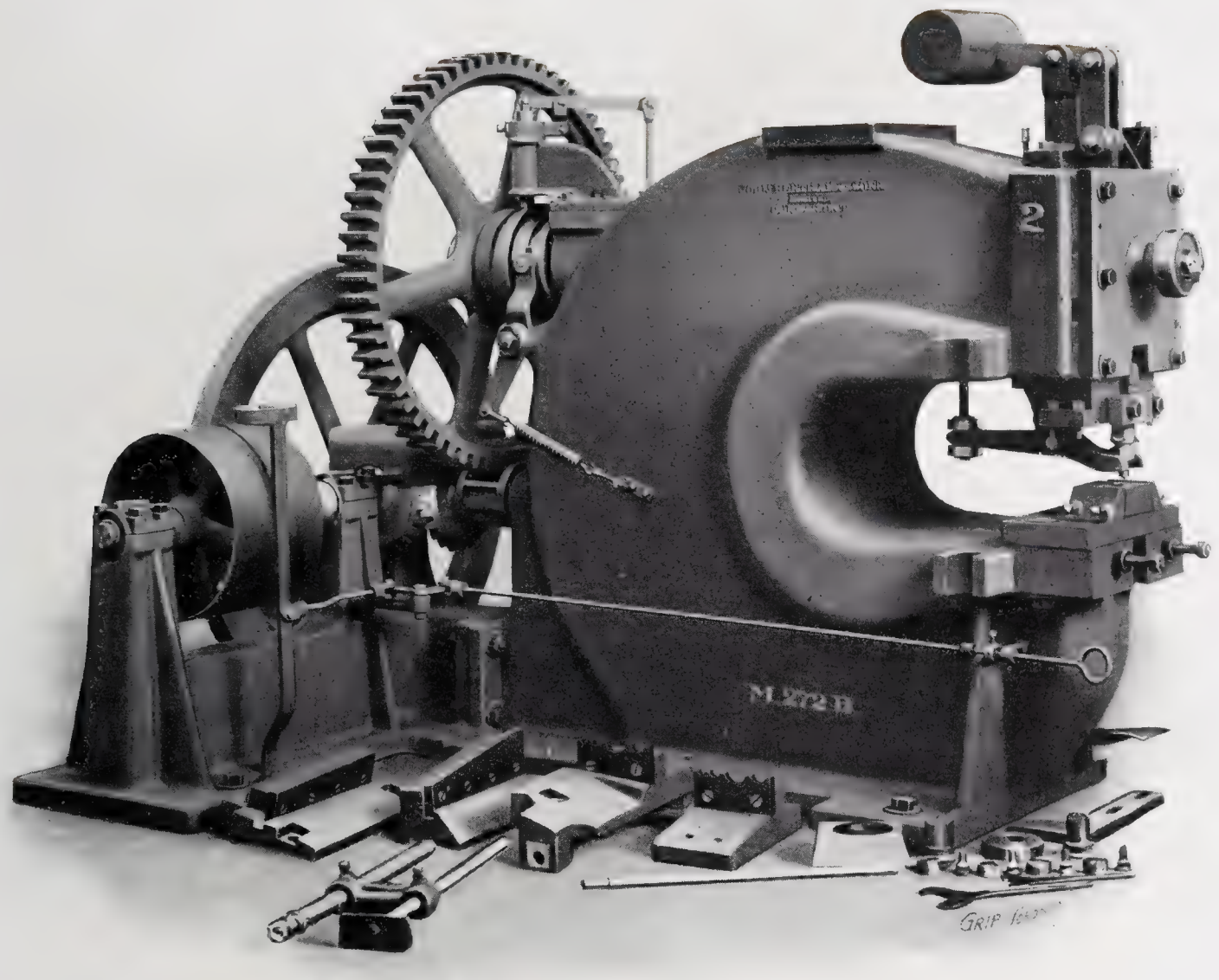
No. 4 SINGLE PUNCHING MACHINE

MOTOR DRIVEN

No. M-272 A

THIS machine is specially adapted for punching angle-bars, eye-beams and channel-bars, and is equipped with brackets and carrying rolls to facilitate the handling of such materials. As illustrated the machine is driven by a direct-connected motor.

Code-Word, with 8-inch depth of throat, belt driven	[illegible]
Code-Word, for direct-connected motor	[illegible]



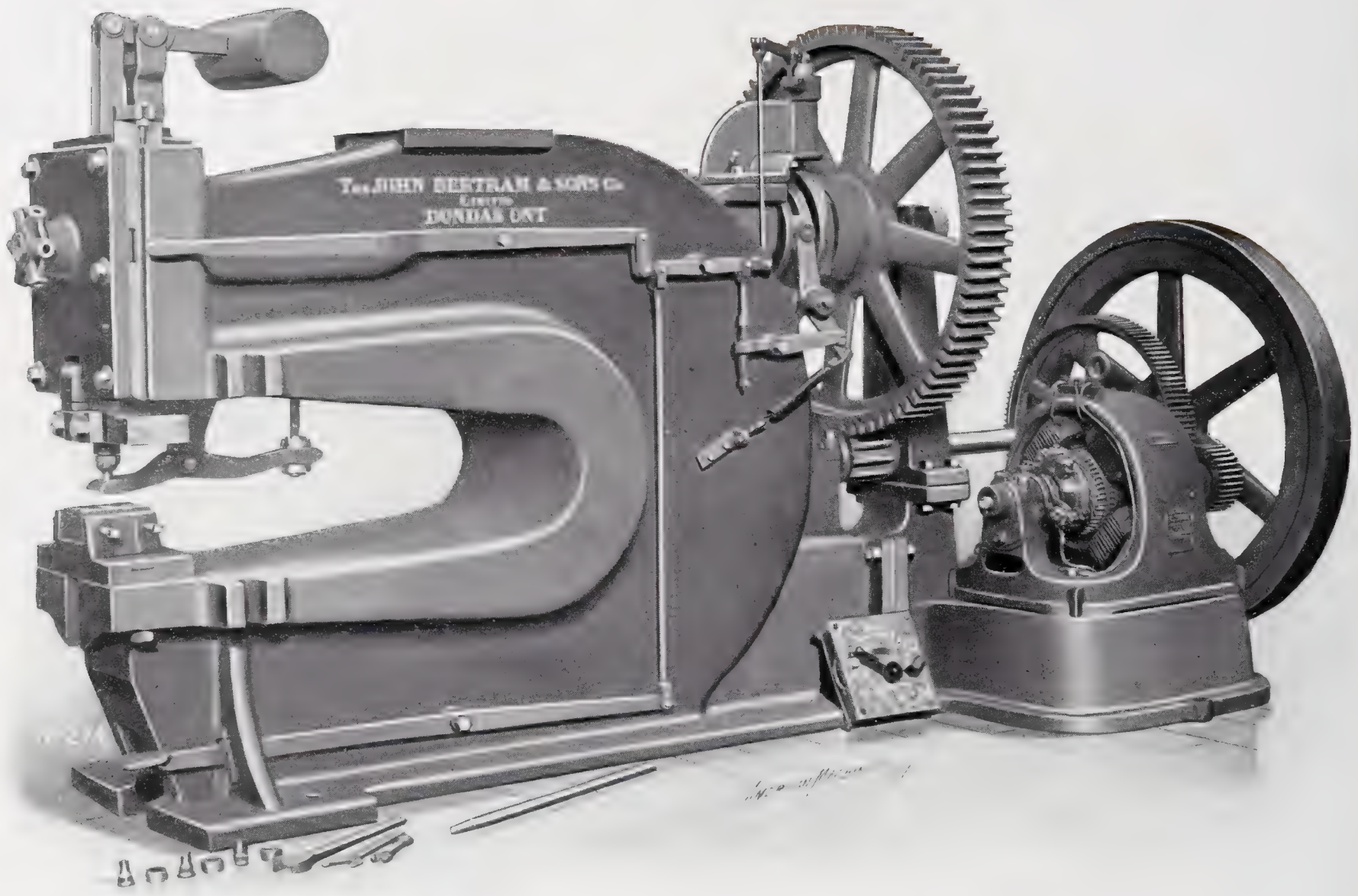
No. 4 SINGLE PUNCHING OR SHEARING MACHINE

No. M-272 B

WHERE it is necessary to set punch at right angles to line-shaft the pulleys can be placed on either side desired. The illustration shows the pulleys at left-hand side of punch. The machine is equipped with automatic-stop, adjustable punch and die-holder, crosscut and splitting shears.

See tabulated lists for capacity of machine and depths of throat.

Code-Word, with 8-inch depth of throat, belt driven	[illegible]
Code-Word, for right-angle drive	HERKOREN
Code-Word, with fixtures for both punching and shearing	HERDSAT
Code-Word, for direct-connected motor	ICEBERG



No. 6 SINGLE PUNCHING OR SHEARING MACHINE

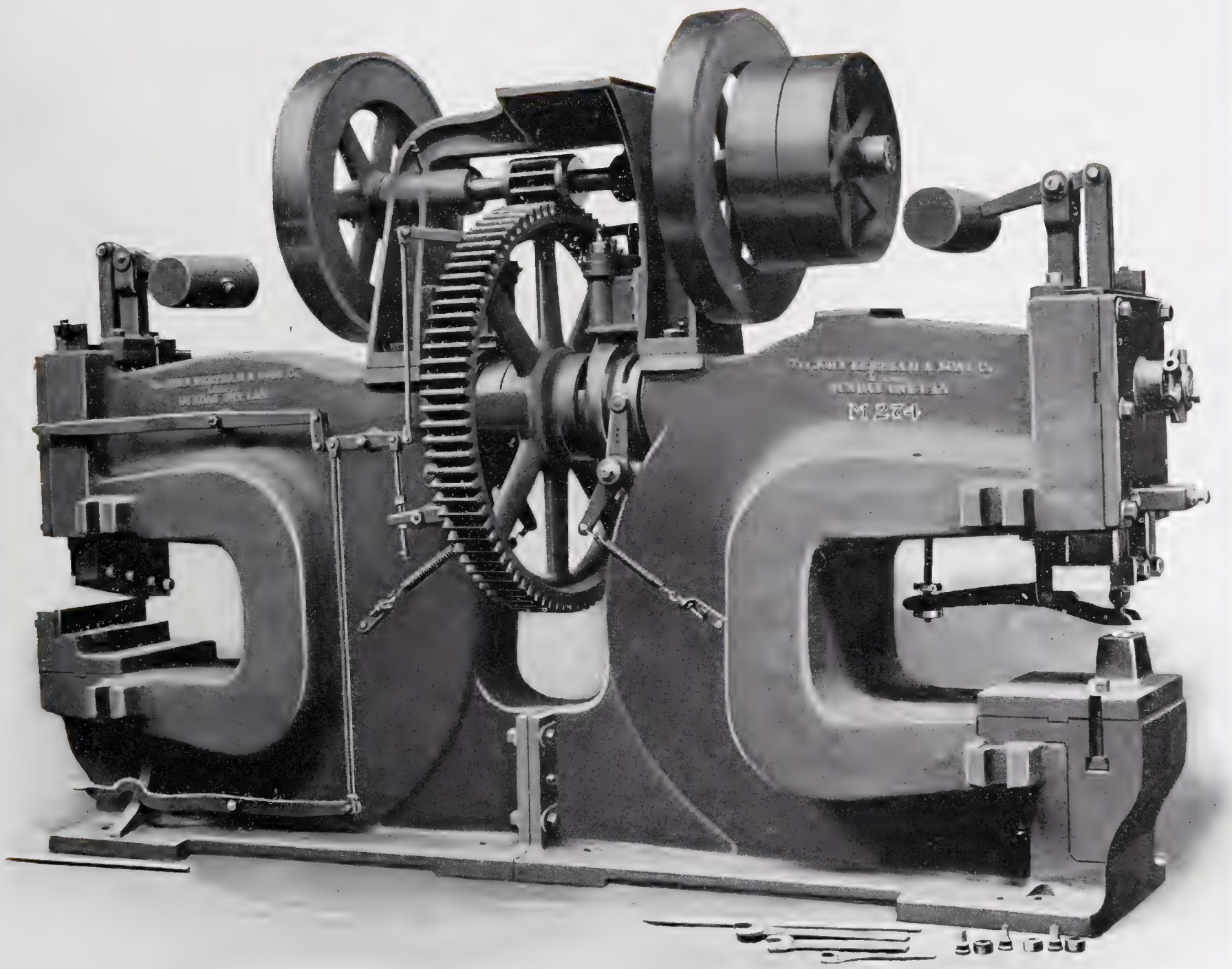
MOTOR DRIVEN

No. M-271

FOR general purpose punching or shearing. Built with varied depths of throat ranging from 12 to 54 inches. Equipped with automatic-stop and adjustable punch and die holder, specially adapted for all classes of boiler work. The machine can be driven by tight and loose pulleys or direct-connected motor as shown.

See tabulated lists for capacity of machine and depths of throat.

Code-Word, with 12-inch depth of throat, belt driven . . . . . HERESIARCH
Code-Word, with fixtures for both punching and shearing . . . . . HERFABLE
Code-Word, for direct-connected motor. . . . . ICEBERG



No. 6 DOUBLE PUNCHING AND SHEARING MACHINE

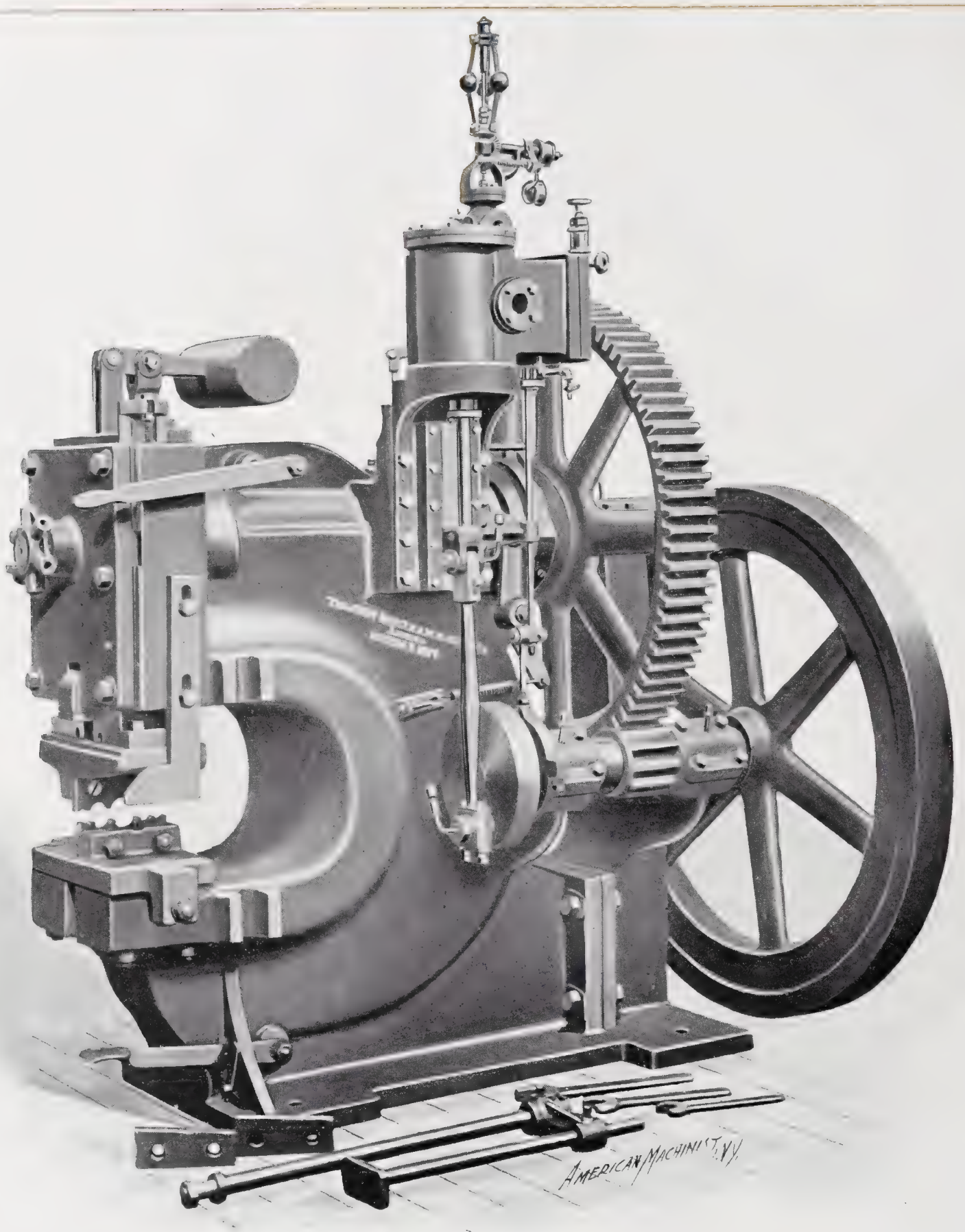
BELT DRIVEN

No. M-274

FOR general purpose punching and shearing. Built with varied depths of throats ranging from 12 to 54 inches. The die-seat at punch-end is removable and can be fitted with varied types of special punching-tools. The shear-end is fitted with splitting-shears and removable blocks. The machine is equipped with automatic-stop controlled by foot-treadle.

See tabulated lists for capacity of machine and depths of throats.

Code-Word, with 12-inch depth of throat . . . . . HERESTEN
Code-Word, for direct-connected motor . . . . . ICEBERG



No. 6 SINGLE PUNCHING OR SHEARING MACHINE

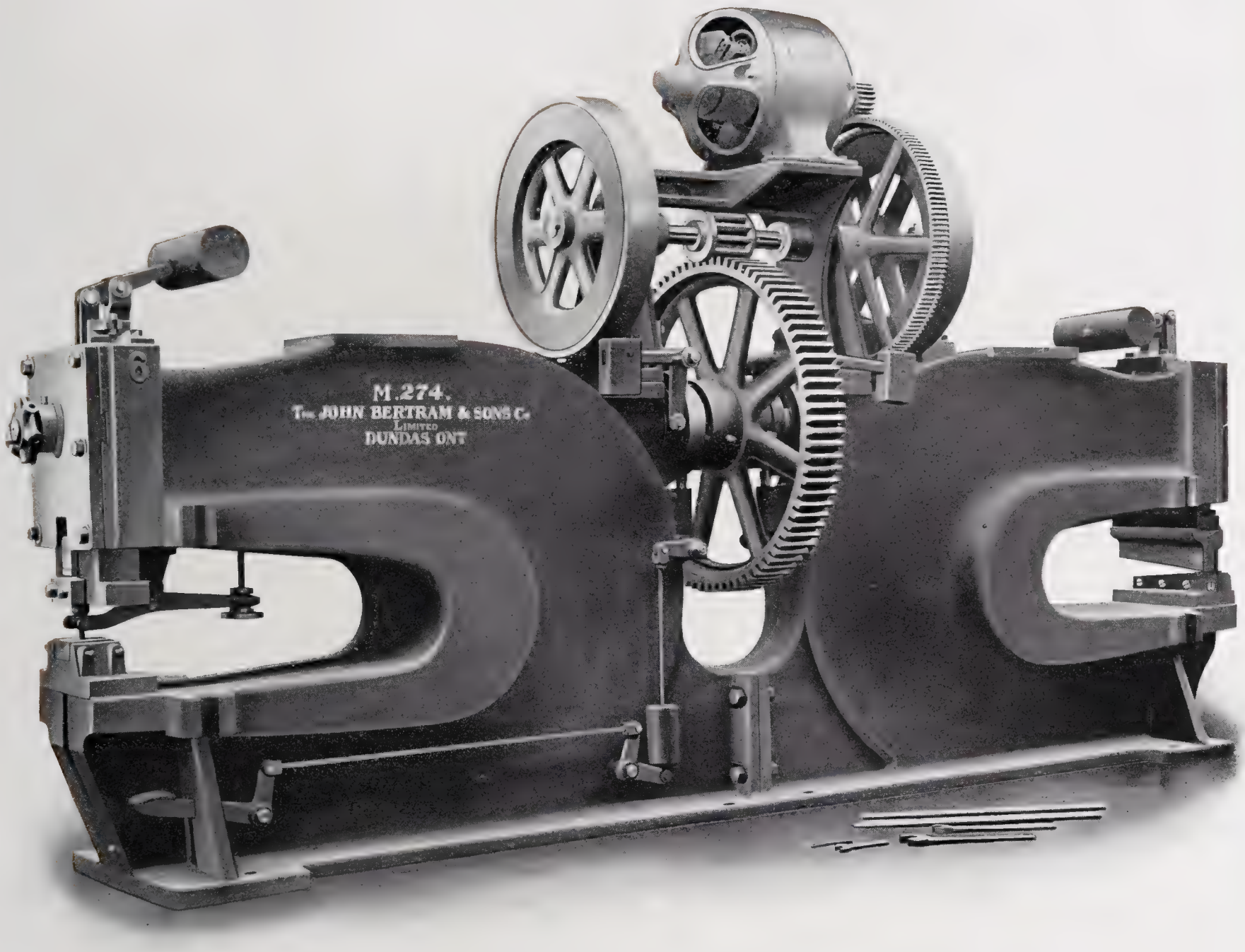
ENGINE DRIVEN

No. M-274

For general purpose punching or shearing. Machine illustrated is shown with shear-blades for cutting off round bars but may be fitted with punching-tools or splitting-shears. Equipped with an automatic-stop and driven by a direct-connected engine.

See tabulated lists for capacity of machine and depths of throat.

Code-Word, arranged for punching . . . . . HERESIARCH
Code-Word, arranged for shearing . . . . . HERETICATE
Code-Word, for engine drive . . . . . ICEAPRON



No. 6 DOUBLE PUNCHING AND SHEARING MACHINE

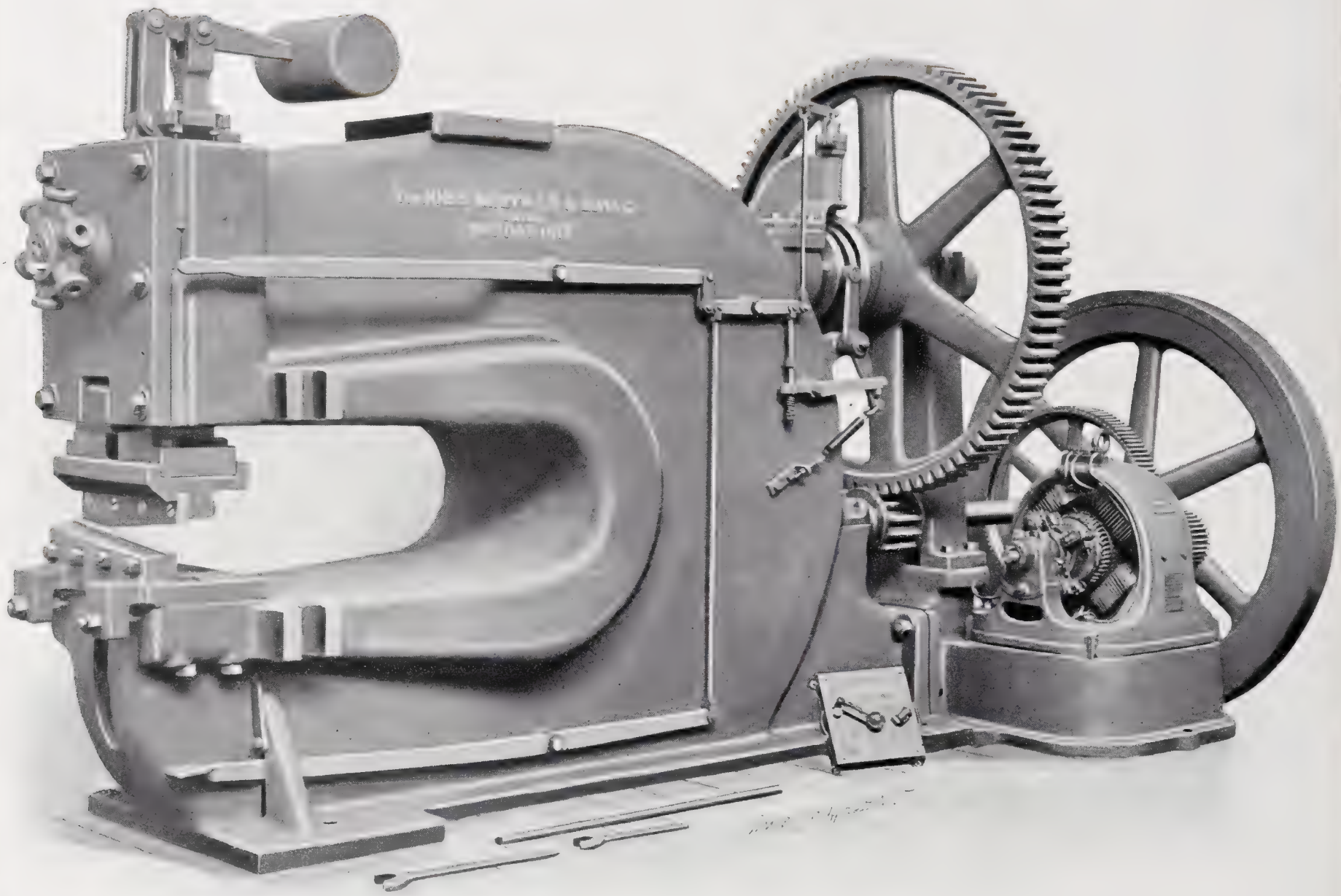
MOTOR DRIVEN

No. M-274

FOR general purpose punching and shearing. Built with varied depths of throats, ranging from 12 to 54 inches. The double machine will do the same amount of work on both sides, and either side will receive punching tools, crosscut or splitting shears. The machine can be driven by tight and loose pulleys or by direct-connected motor as illustrated.

See tabulated lists for capacity of machine and depths of throats.

Code-Word, with 36-inch depth of throats, belt driven . . . . . HEREUHRST
Code-Word, for direct-connected motor. . . . . ICEBERG



No. 7 SINGLE PUNCHING OR SHEARING MACHINE

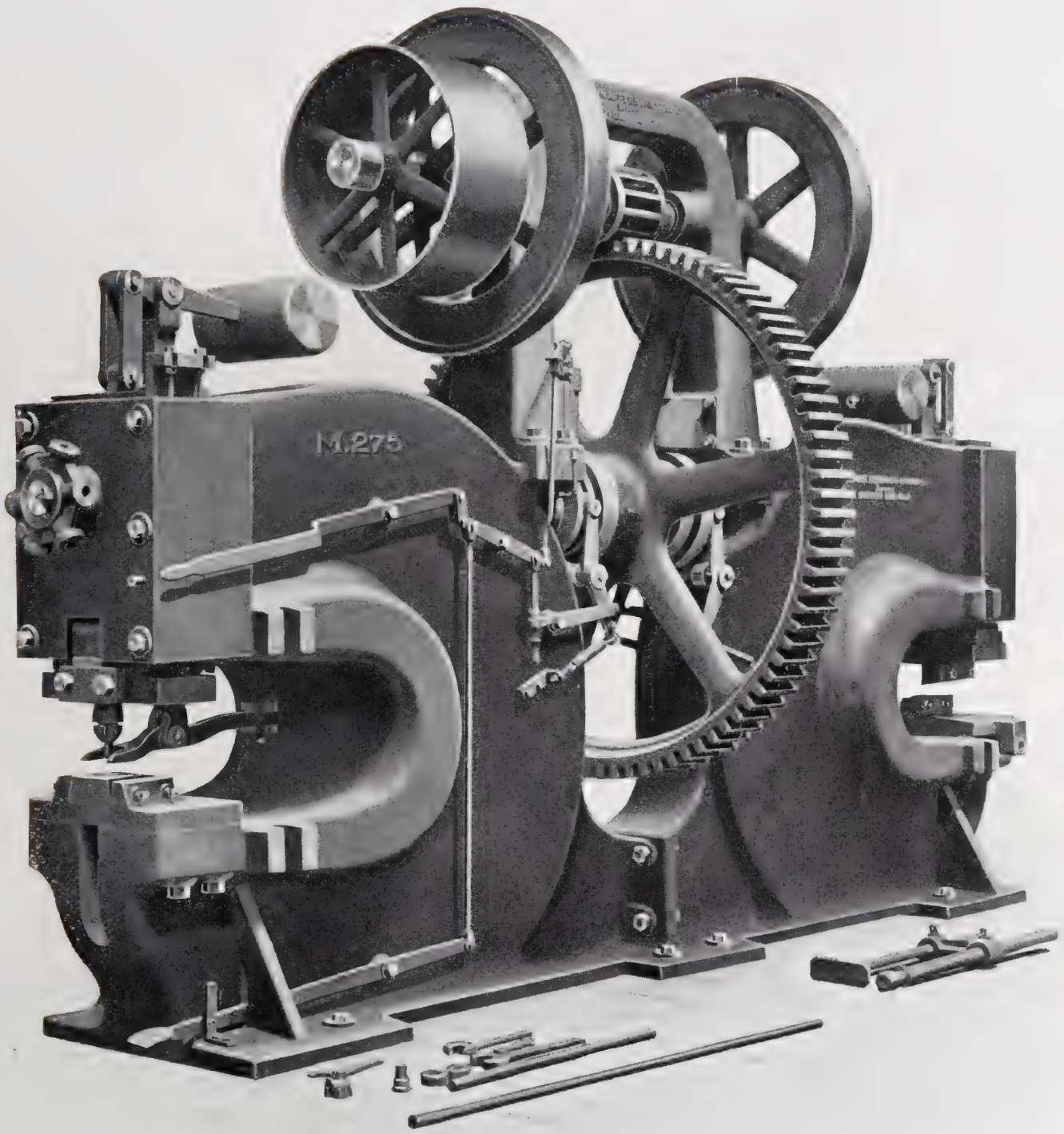
MOTOR DRIVEN

No. M-275 C

For general purpose punching or shearing. Built with varied depths of throat, ranging from 15 to 60 inches. Will receive punching-tools, cross-cut or splitting shears. The machine illustrated is driven by direct-connected motor.

See tabulated lists for capacity of machine and depths of throat.

Code-Word, with 15-inch depth of throat, belt driven. . . . . HERFURTHAT
Code-Word, with fixtures for both punching and shearing . . . . . HERGEHORT
Code-Word, for direct-connected motor . . . . . ICEBERG



No. 7 DOUBLE PUNCHING AND SHEARING MACHINE

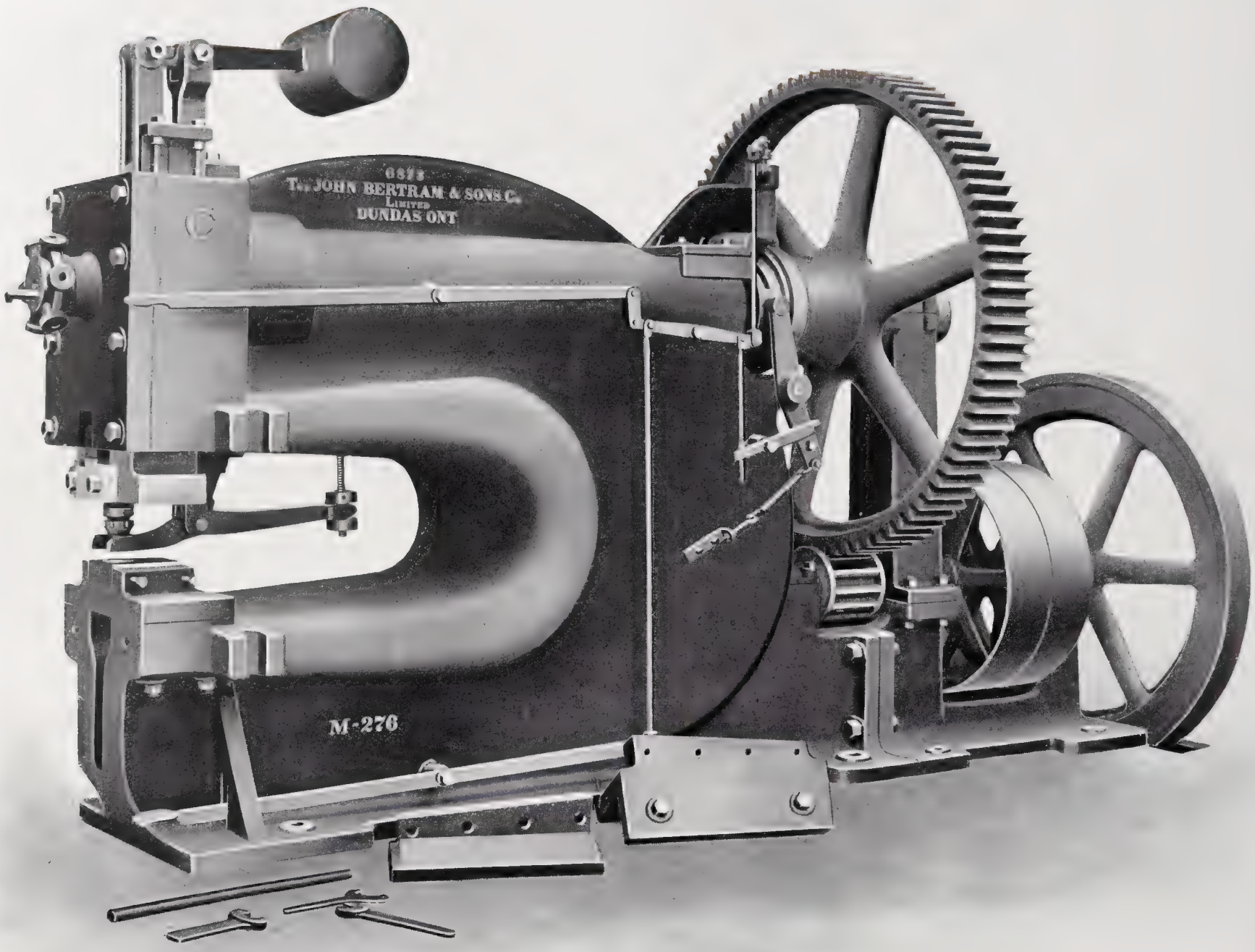
BELT DRIVEN

No. M-275

FOR general purpose punching and shearing. Built with variet depths of throats, ranging from 15 to 60 inches. As illustrated, one side is fitted for punching and the other for shearing, but punching-tools, crosscut or splitting shears can be used on either or both sides.

See tabulated lists for capacity of machine and depths of throats.

Code-Word, with 15-inch depth of throats, belt driven . . . . . HERGEVEN
Code-Word, for direct-connected motor . . . . . ICEBERG



No. 8 SINGLE PUNCHING OR SHEARING MACHINE

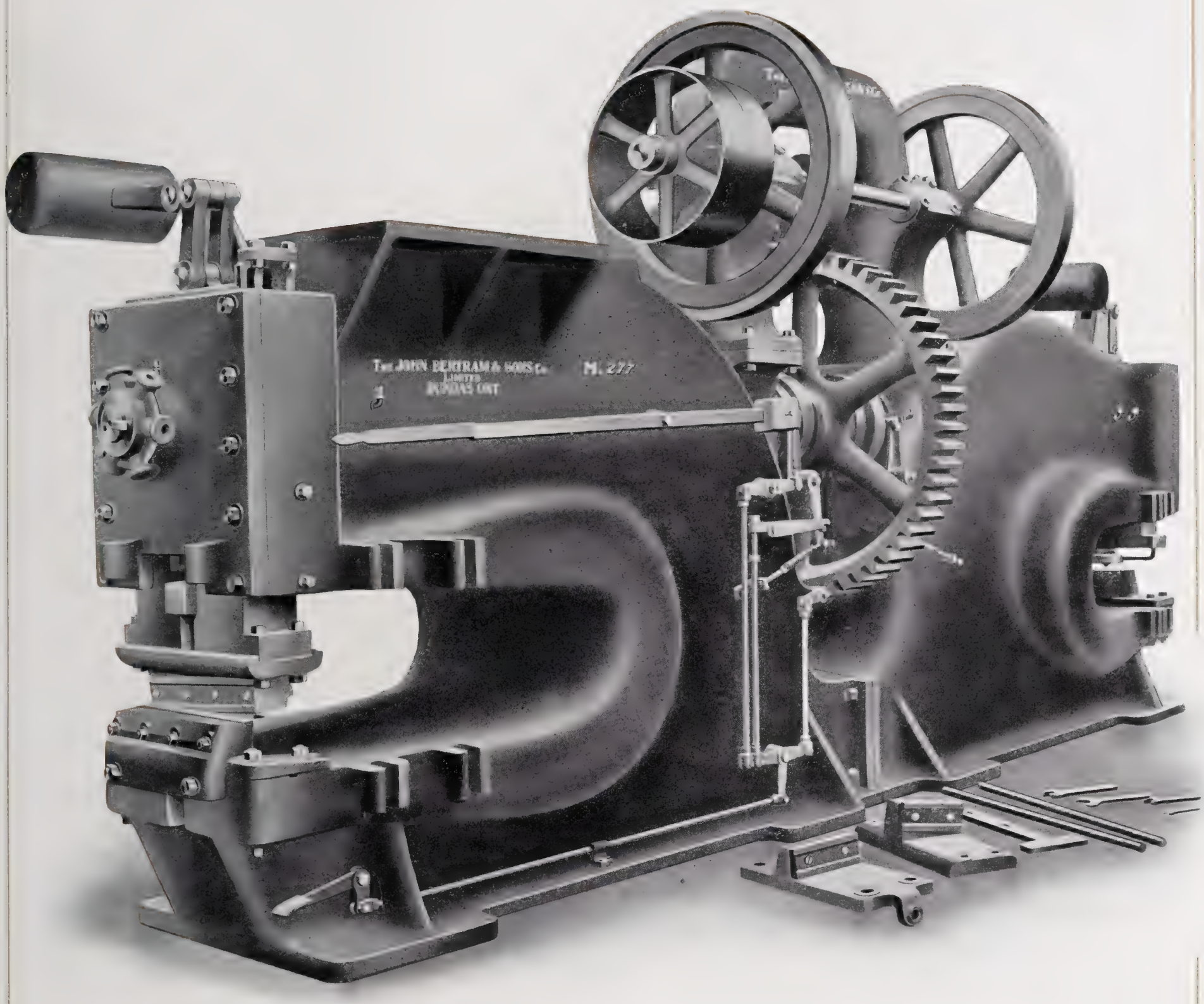
BELT DRIVEN

No. M-276

FOR general purpose punching or shearing. Built with varied depths of throat, ranging from 15 to 72 inches. As shown the jaw is designed for structural and shipyard work. The lower die-block is specially arranged for punching close to the corners of flanges. When desired to attach any standard punching or shearing tools a heavy cast-iron filling-in block is bolted to the lower jaw so that the utility of the machine for ordinary punching or shearing is not impaired by its special features.

See tabulated lists for capacity of machine and depths of throat.

Code-Word, with 15-inch depth of throat, belt driven	HERGRINSEN
Code-Word, with fixtures for both punching and shearing	HERHOLTE
Code-Word, for direct-connected motor	ICEBERG



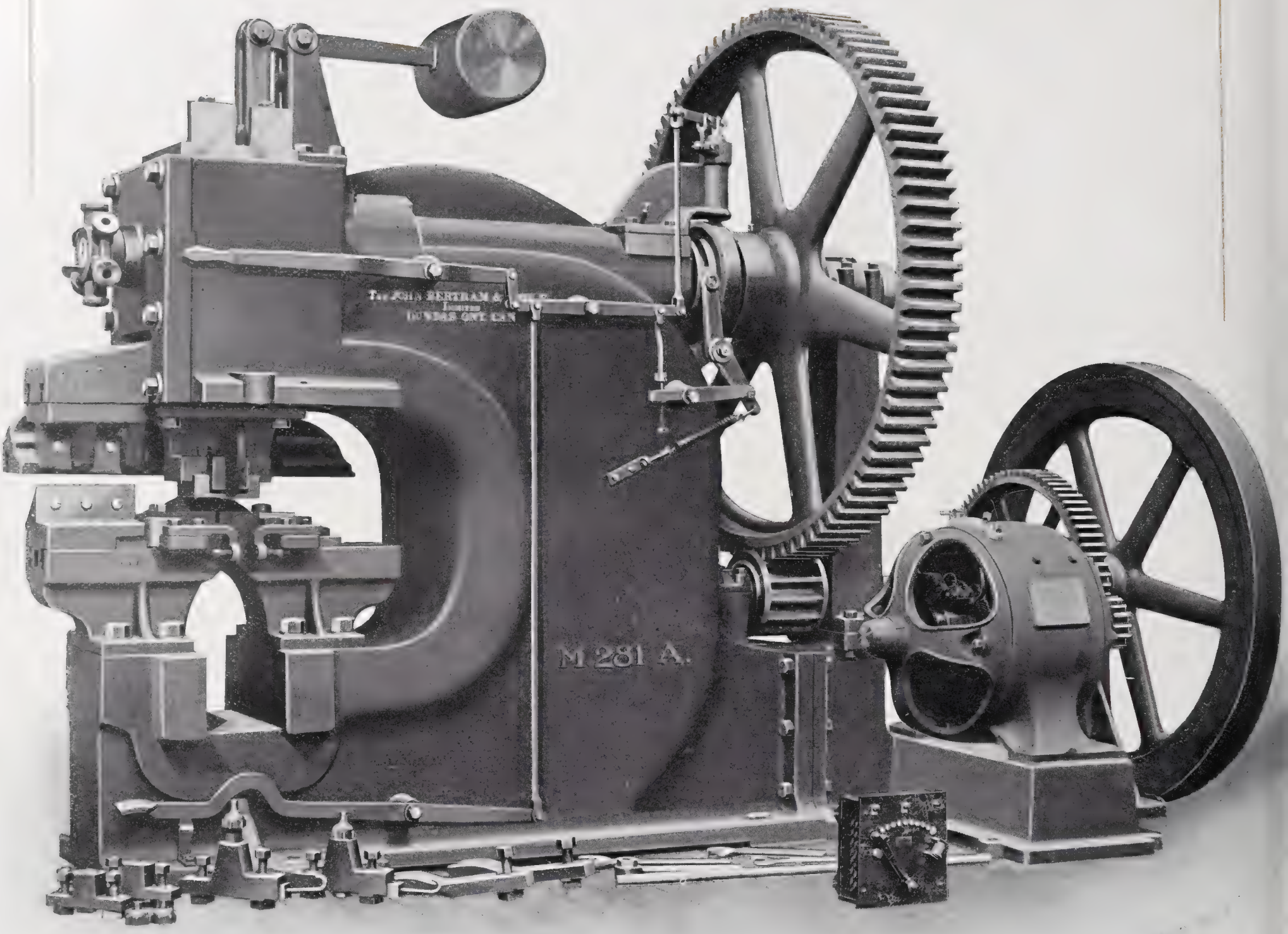
No. 10 DOUBLE PUNCHING AND SHEARING MACHINE

No. M-277

FOR general purpose punching and shearing. Built with varied depths of throats, ranging from 18 to 72 inches. The respective sides run independently of each other, are operated by steel-faced clutches and stopped automatically on completion of each stroke. The illustration shows a belt-driven machine with throats of equal depth, 72 inches, one side fitted for punching and the other side for shearing.

See tabulated lists for capacity of machine and depths of throats.

Code-Word, with 18-inch depth of throats, belt driven . . . . . HERKEURT
Code-Word, for direct-connected motor . . . . . ICEBERG

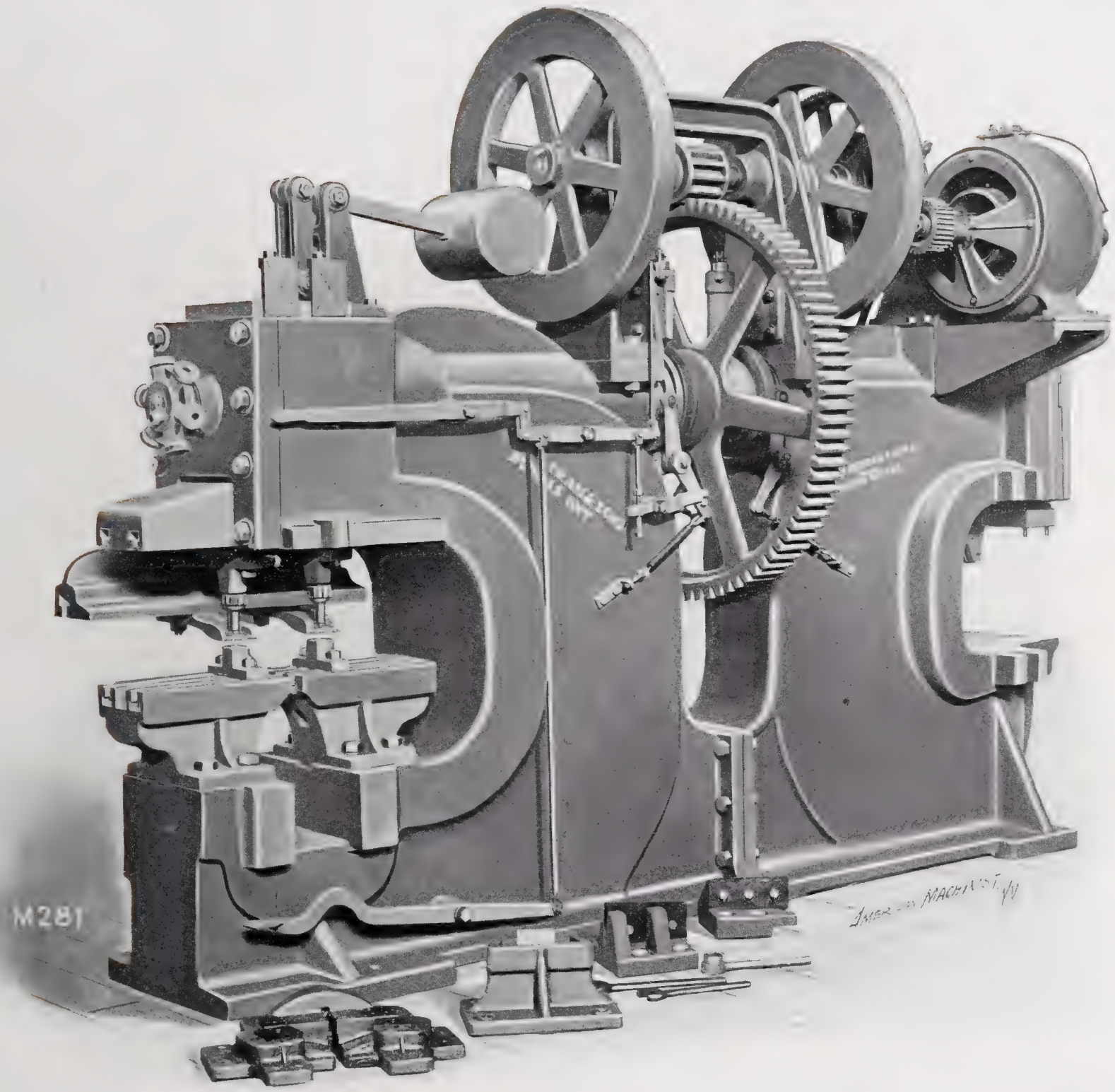


BEAM AND CHANNEL PUNCHING AND COPING MACHINE

No. M-281 A

DEPTH of throat to center of sliding head, 25 inches. Punches and dies have an adjustment of 2½ to 24 inches center to center. Each punch is controlled by a gag. The capacity of the machine is equal to punching two 1⅛-inch diameter holes through 1 inch thickness. Flanges of all sizes of beams up to 24 inches may be punched and also a great variety of general bridge and structural work. Coping and notching attachment is supplied which is interchangeable with the punching-tools.

Code-Word, beam and channel punching and coping machine . . . . . HEIDFEUER
Code-Word, for direct-connected motor . . . . . ICÉBERG

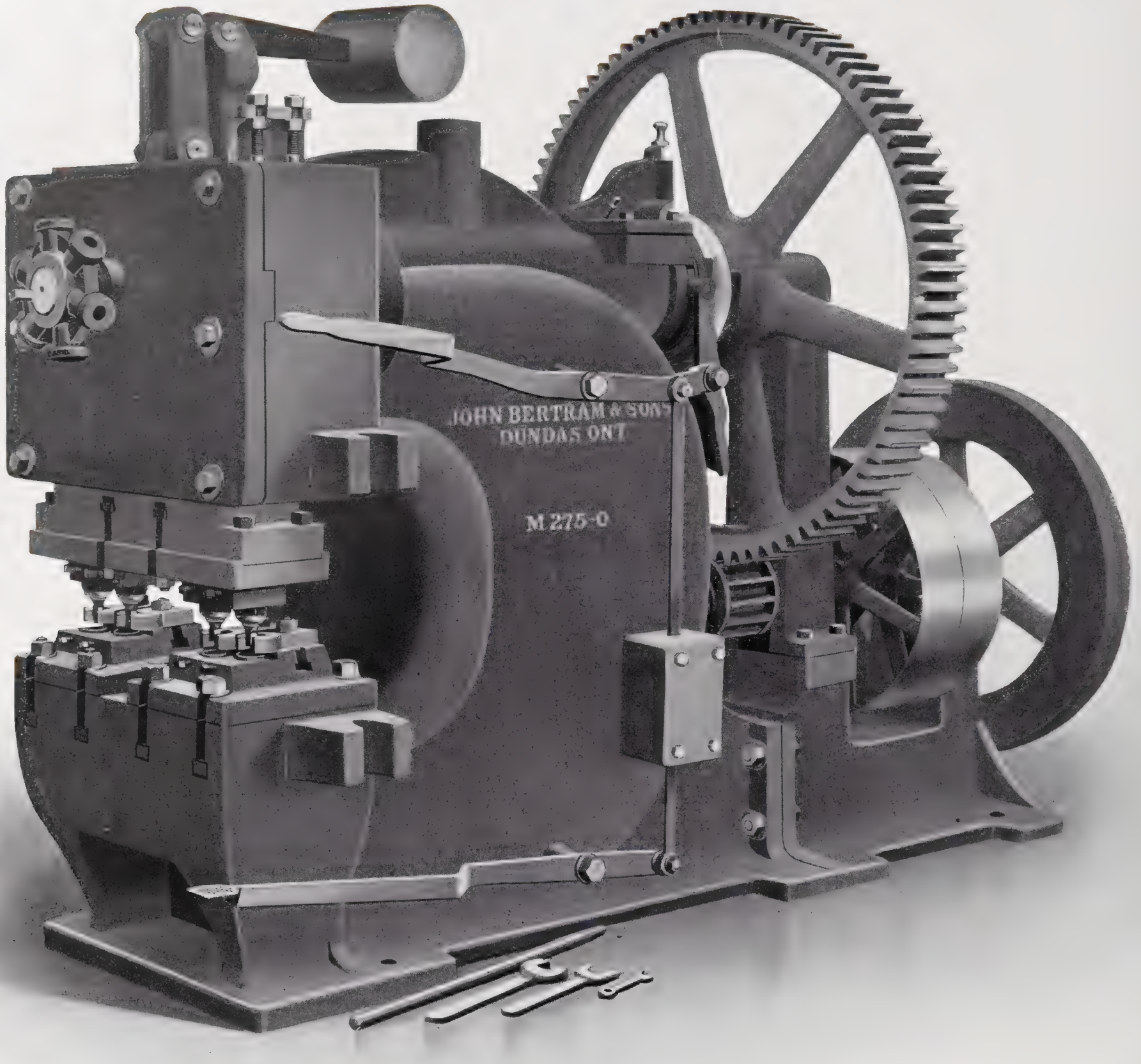


PUNCHING, COPING AND SHEARING MACHINE

No. M-281

THIS machine is designed for structural work. One end will receive any standard punching or shearing attachment, and the other end is arranged for punching structural material, also for coping and notching beams and channels. Depth of throat to center of sliding head, 25 inches. Punches and dies have an adjustment of 2½ to 24 inches center to center, and each punch is controlled by a gag. The capacity of the machine is equal to punching two 1⅛-inch holes through 1 inch thickness. A coping and notching attachment is supplied which is interchangeable with the punching-tools.

Code-Word, double machine, with fixtures for punching, coping and shearing. . . . . HEIKLICH
Code-Word, for direct-connected motor. . . . . ICEBERG



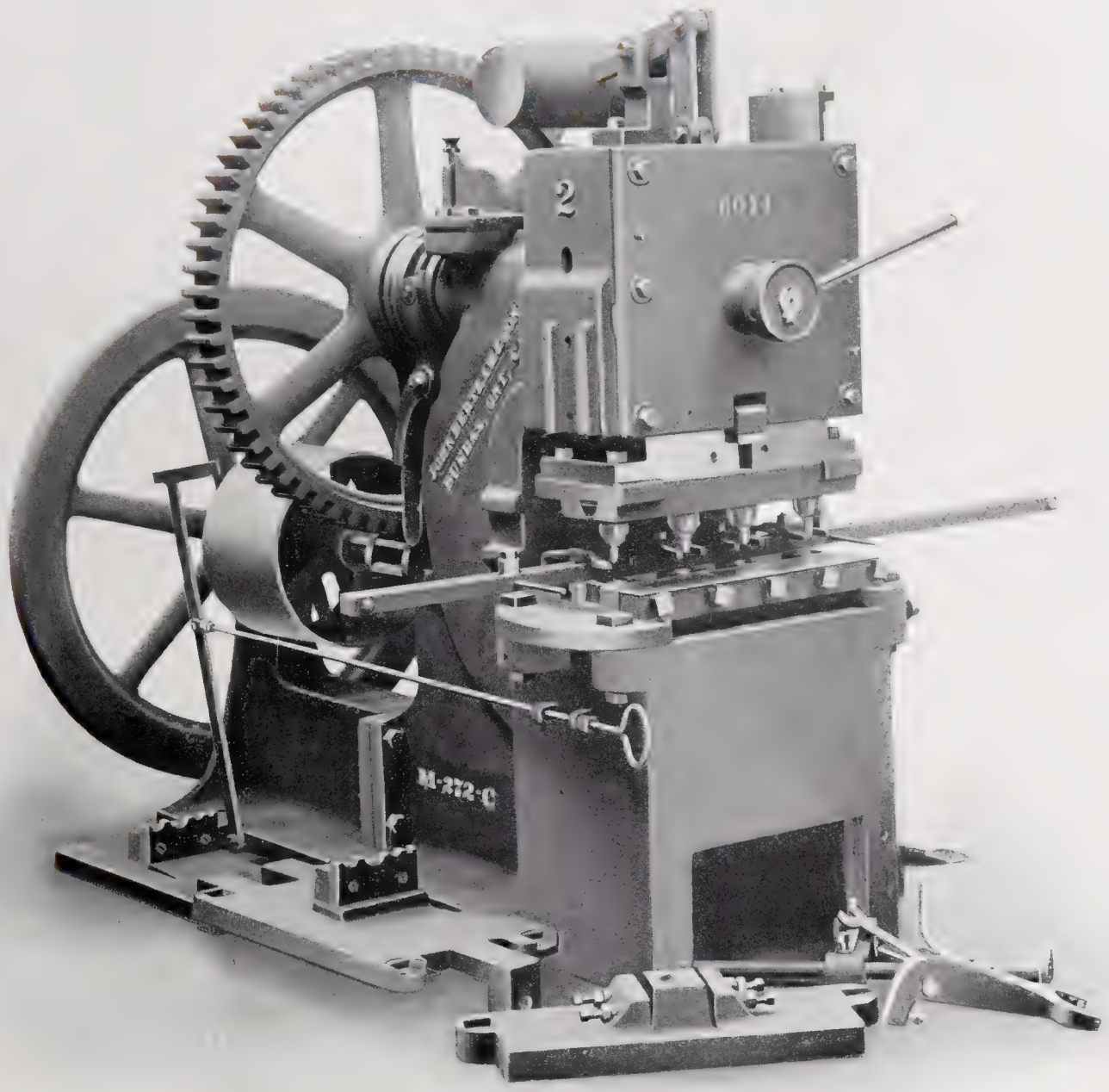
No. 7 PUNCHING MACHINE

WITH MULTIPLE ATTACHMENT

No. M-275 O

ARRANGED for multiple punching of structural shapes and tie-plates with a capacity to punch four holes ⅞-inch diameter in ¾-inch material, or the equivalent of this. The design of punching attachments may be modified to suit different requirements.

Code-Word, with 15-inch depth of throat, belt driven	HERFURTHAT
Code-Word, arranged for multiple punching	HERKOMEN
Code-Word, with fixtures for both punching and shearing	HERGEHORT
Code-Word, for direct-connected motor	ICEBERG

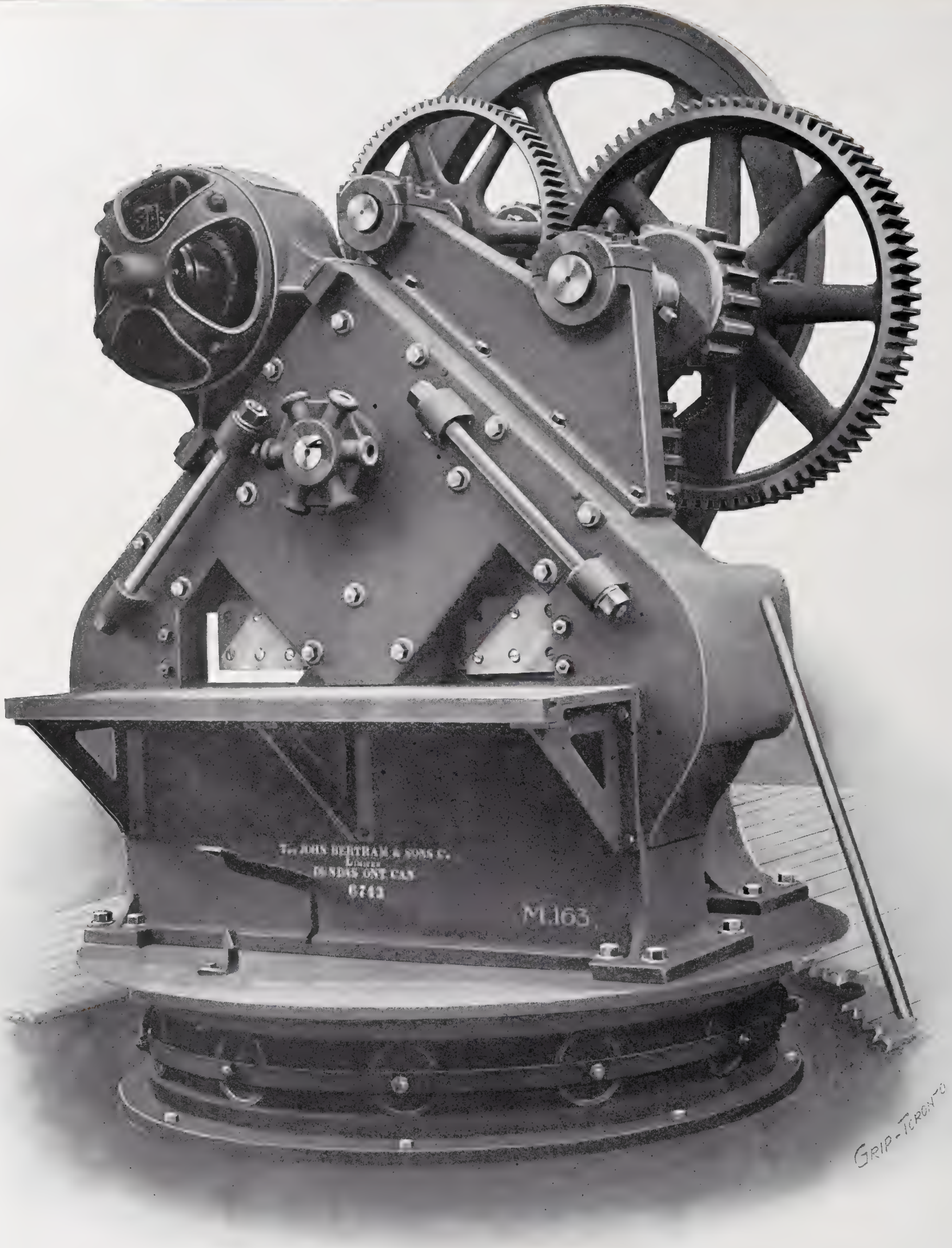


No. 4 MULTIPLE PUNCHING MACHINE

No. M-272 C

ARRANGED for multiple punching of structural shapes and plates. The punches and dies are adjustable and fitted in holders which are held in grooves in the head and lower jaw, so that the tools may be easily and quickly changed. The design of punching attachments may be modified to suit different requirements Machine can be driven by tight and loose pulleys or direct-connected motor

Code-Word, with 8-inch depth of throat, belt driven . . . . . HERDOENING
Code-Word, with fixtures for both punching and shearing . . . . . HERDSAU
Code-Word, arranged for multiple punching. . . . . HERKOMEN

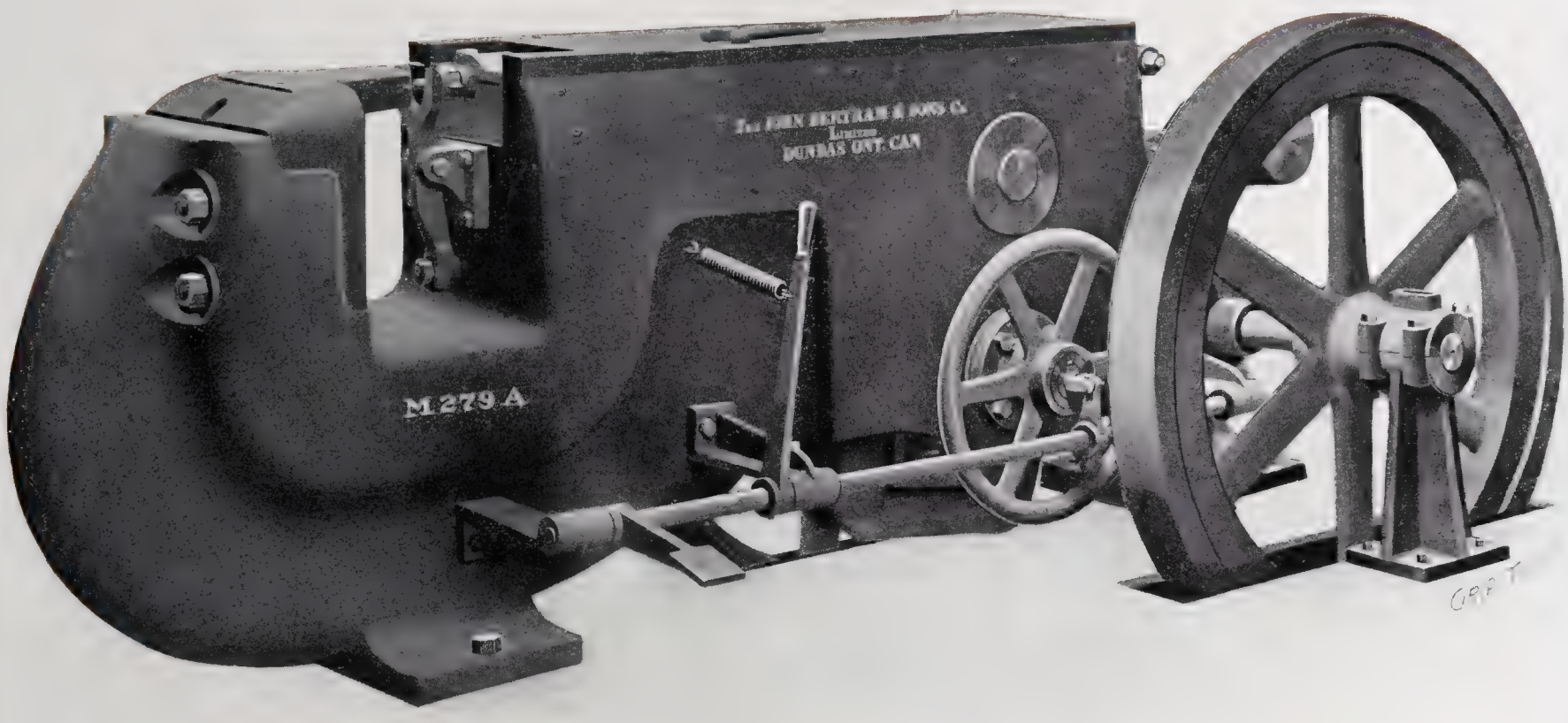


No. 3 DOUBLE ANGLE SHEAR

No. M-381

WILL shear 8 x 8 x ¾-inch angle-bars, straight or on a bevel. The heads are steel and receive their motion through an eccentric shaft which is started and stopped by foot lever. The machine illustrated is mounted on a circular base on which it revolves by hand-wheel, rack and pinion. As shown it is driven by direct-connected motor.

Code-Word, with stationary base . . .	HOCICO
Code-Word, with circular base. . . .	HOCICONES
Code-Word, for direct-connected motor	ICEBERG

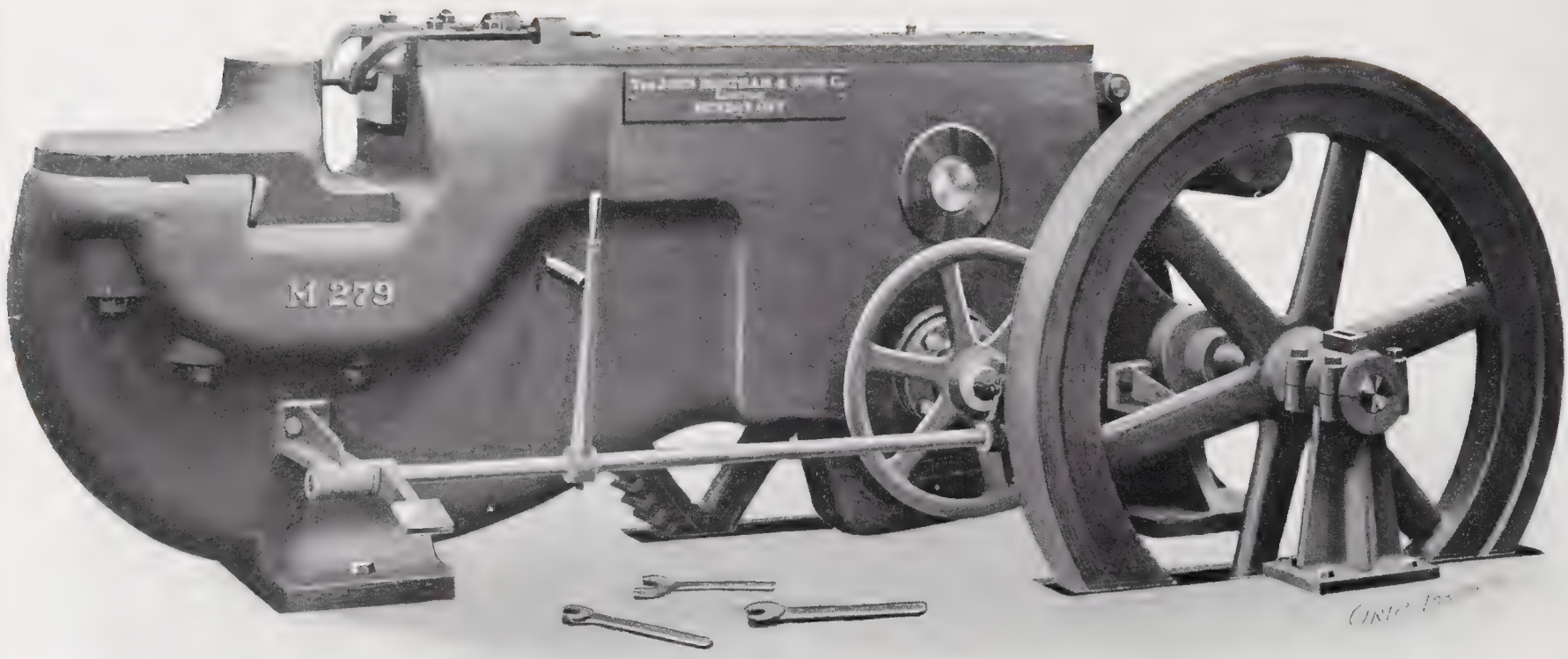


HORIZONTAL PUNCH

No. M-279 A

EQUIPPED with architectural jaw specially designed for punching channel and angle-beams, and flanges of boiler heads. Provided with automatic-stop and regular punching attachment.

Code-Word. . . . . HEIDEROOK



HORIZONTAL PUNCH

No. M-279

DEPTH of throat, 12 inches. Capacity, 1 $\frac{5}{16}$-inch diameter hole through 1 ¼-inch thickness. The steel stake carrying the die makes the machine convenient for punching small diameters. The head is controlled by an adjustable automatic-stop.

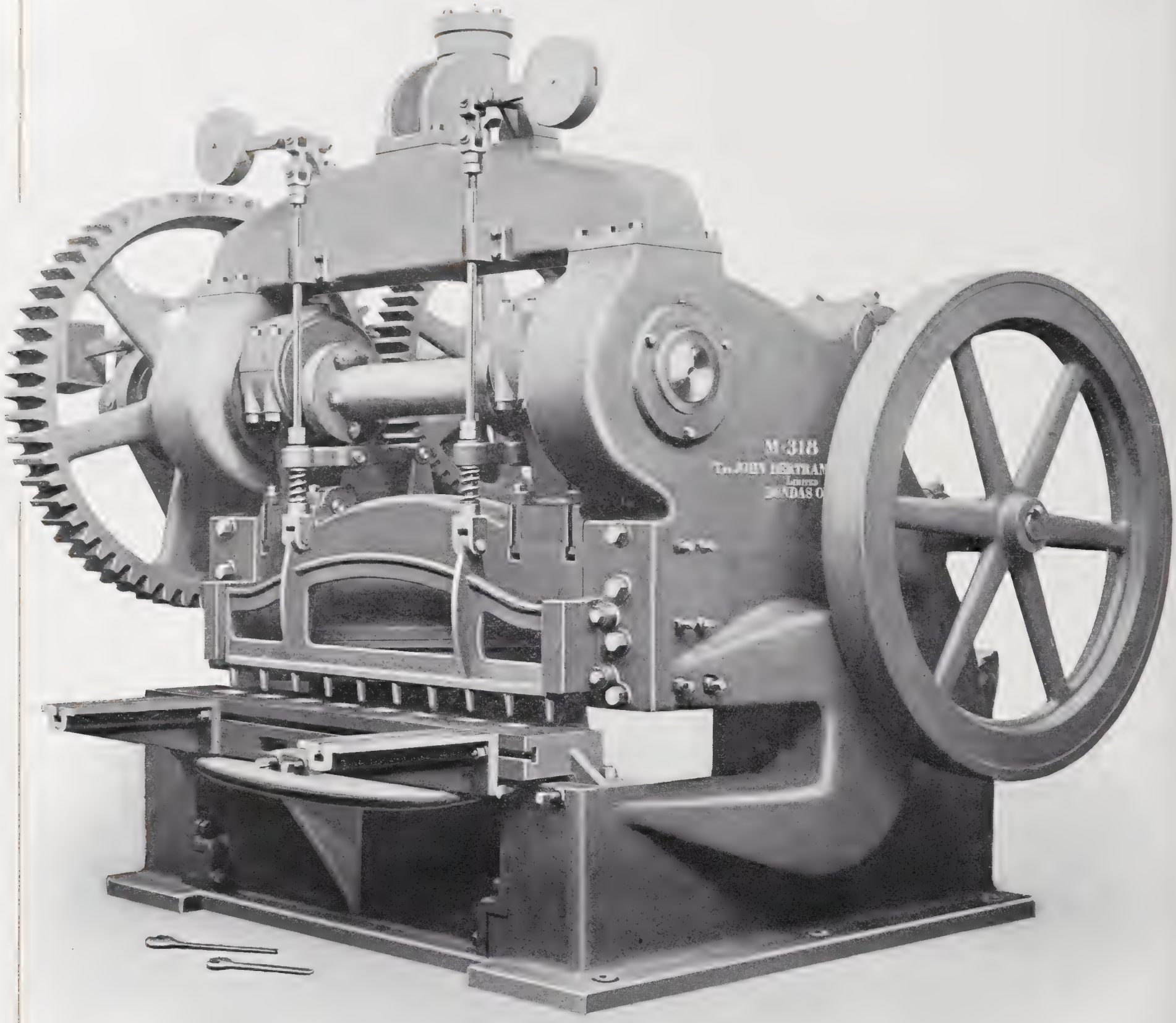
Code-Word HEIDESEGGE

PLATE SHEARING MACHINES

ON the following pages we illustrate a line of Plate Shearing Machines with throats of various depths. Plates not exceeding in width the distance between the housings can be passed through the machine and cut to any length. Wider plates can be trimmed or split to a distance from the edge corresponding to the depth of the throat. Machines are provided with automatic hold-down to clamp the sheet while it is being sheared, automatic-stop to stop the slide at the completion of stroke with the blades open, and table or brackets for supporting the work. These machines can be driven by belt or with steam engine or direct-connected motor.

DIMENSIONS

No. of Machine	Width Between Housings	Diameter of Pulley	Width of Face of Pulley	Code-Word with Stationary Base
	Inches	Inches	Inches	
M—285	20	36	9	HOCKIN
M—318C	60	36	9	HODDLE
M—318	72	[illegible]	10	HOCKO

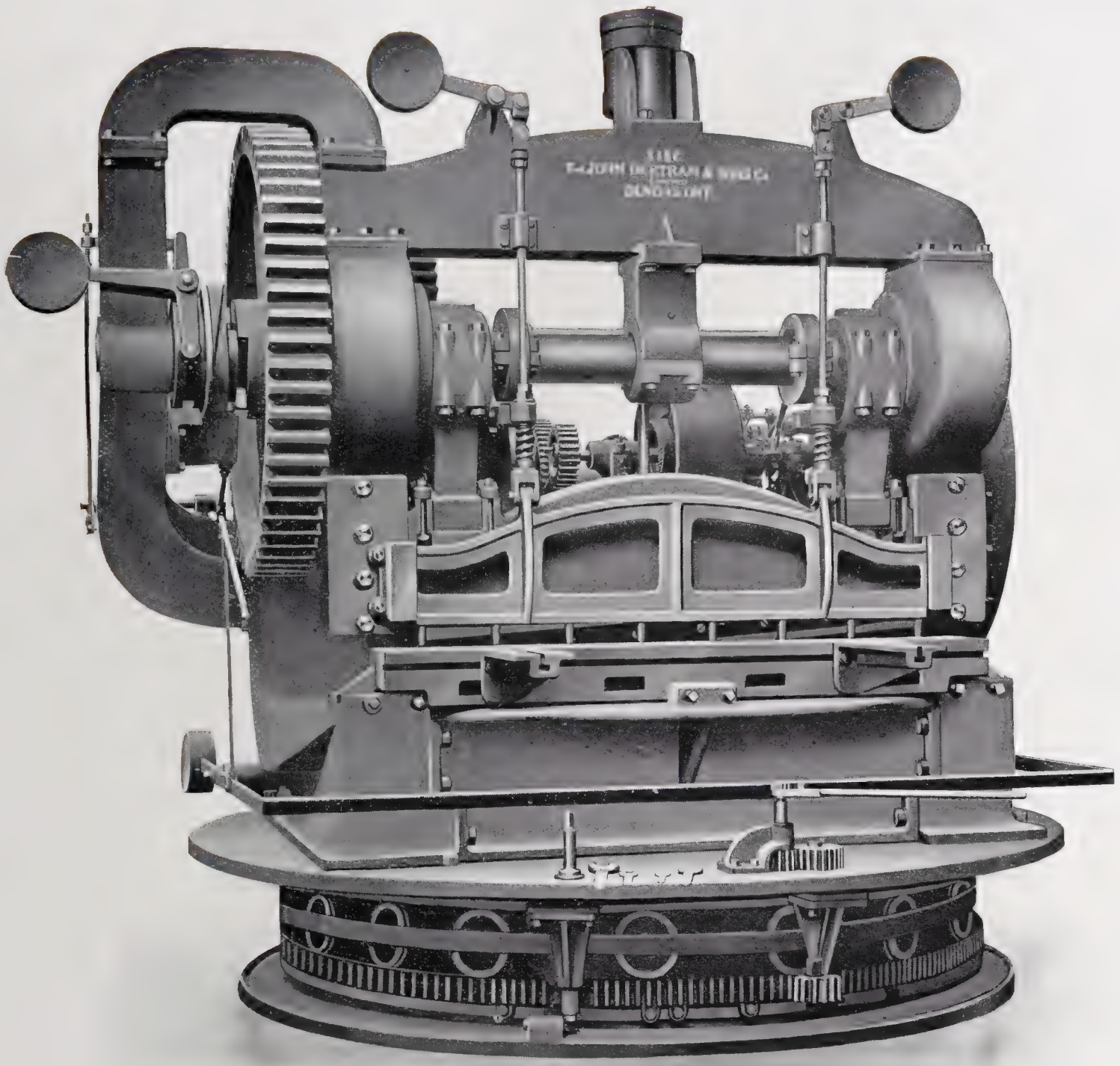


No. 6 GATE SHEAR

No. M-318

THE illustration represents our heavy double-geared Gate Shear. It admits 72 inches between the housings, has 24-inch depth of throat and a capacity to shear 1-inch plate. The head is started and stopped by hand lever or treadle connected with the clutch. When stopped the head is always at the upper end of stroke. We make this machine 60, 72 and 84 inches between the housings.

Code-Word . . . . . HOCKO
Code-Word, for direct-connected motor . . . . . ICEBERG

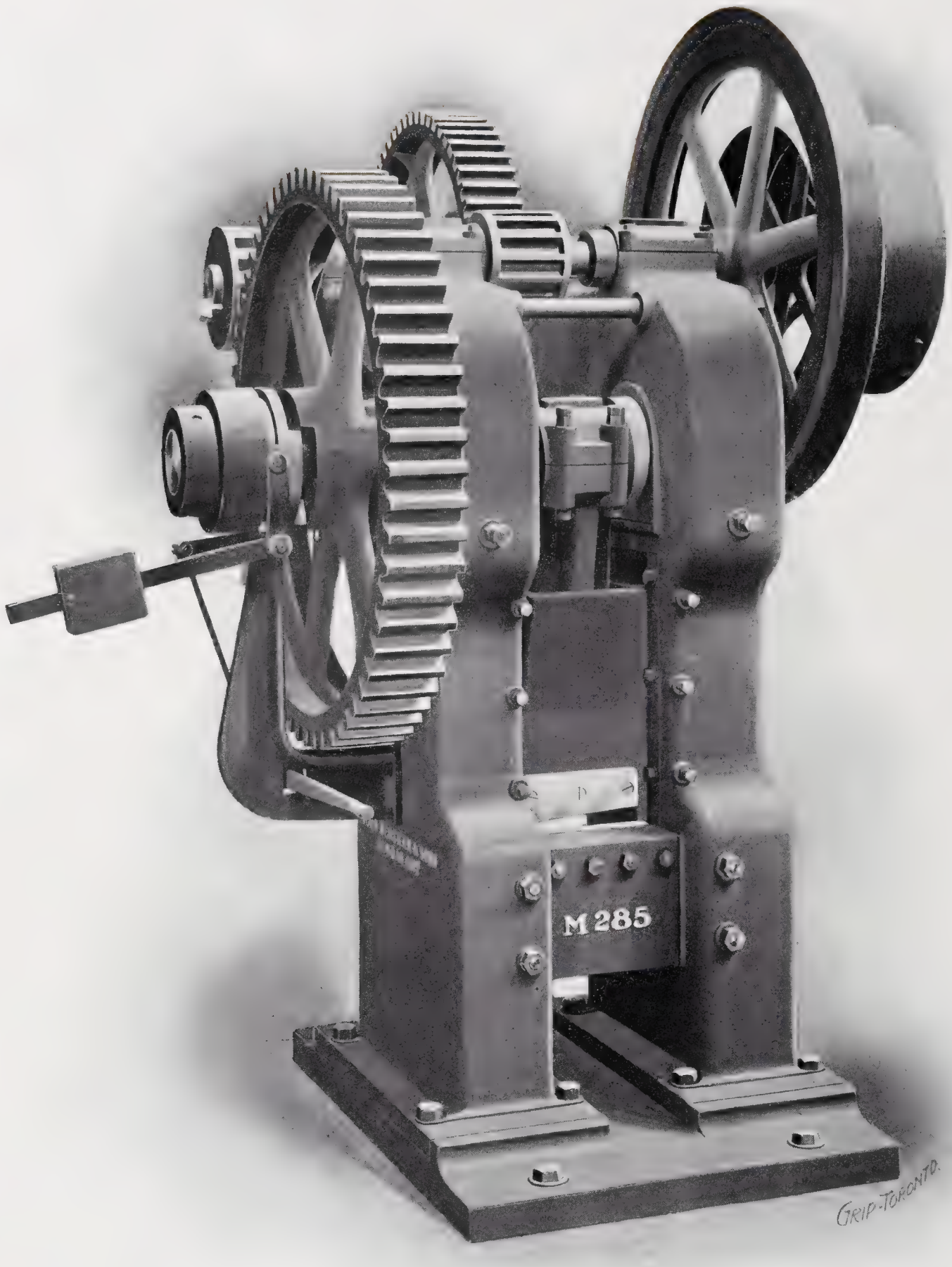


No. 6 GATE SHEAR ON TURNTABLE

No. M-318 C

THIS machine is designed for crosscutting and splitting long or wide plates up to 1 inch in thickness. It will admit 60 inches between the housings and has a throat depth of 18 inches. The sliding head is counterbalanced by a cylinder for steam or air pressure, and is equipped with an iron table and automatic hold-down for clamping the sheets while being sheared. It is under perfect control by treadle. We make this machine 60 and 72 inches between the housings, with or without turntable.

Code-Word, with stationary base . . . . . HODDLE
Code-Word, with circular base . . . . . HODDY
Code-Word, for direct-connected motor . . . . . ICEBERG

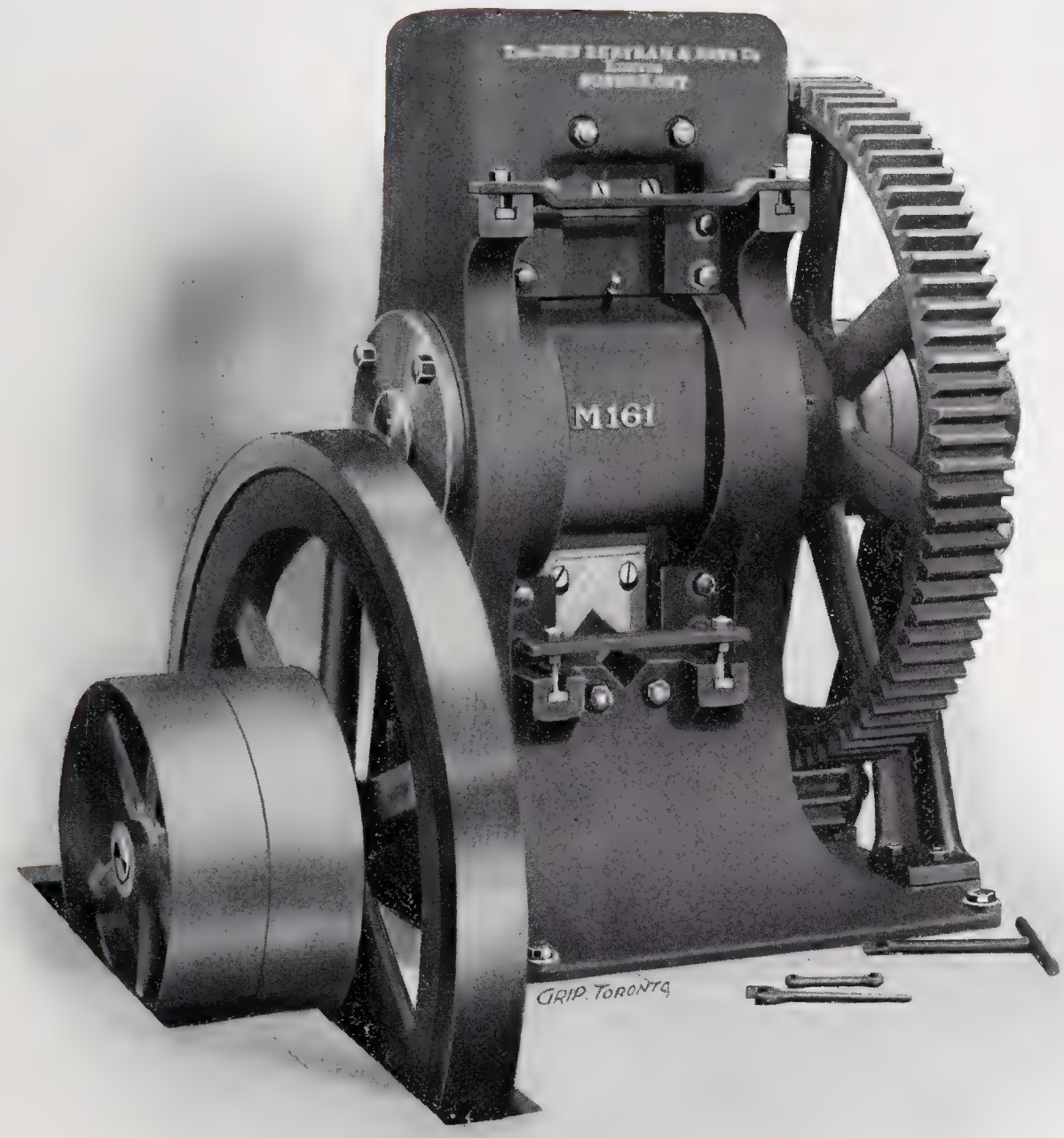


No. 1 GATE SHEAR

No. M-285

THE illustration shows belt-driven machine 20 inches wide between housings, having a capacity to cut off 1-inch plate 16 inches wide at each stroke of the slide. It is powerfully geared and provided with automatic-stop which brings the slide to rest with the blades open for the next cut. We make this machine 20, 24 and 30 inches between the housings. Machine can be driven by tight and loose pulleys or direct-connected motor.

Code-Word . . . . . HOCKIN



No. 1 BAR SHEARING MACHINE

No. M-161

CAPACITY 6 × 1-inch flat or 1¼-inch round bar. The machine is provided with automatic-stop and hold-down clamp to prevent the bar from tipping, and a gauge at the rear adjustable for different lengths. Machine can be driven by tight and loose pulleys as shown, or direct-connected motor.

Code-Word . . . . . HOCKENER

PLATE PLANING MACHINES

PLATE PLANING MACHINES

DESIGNED for planing boiler plates with bevel or square line edges. The tool-slides are arranged with two tools, one cutting in each direction, and may be made either plain or compound. The compound tool-slide has vertical adjustment. The housings overhang so that any length of plate may be planed by resetting the work. The carriages are driven by heavy screws and are reversed automatically by adjustable dogs on the shifting-rod along the front of the beds. The clamping-beams are of steel structure, built-up type, and carry on their lower flange a number of trucks by means of which clamping screw-jacks are suspended.

DIMENSIONS

No. of Machine	Thickness of Plate		Usual Lengths to Plane at One Setting	Countershaft-Pulleys		Code-Words	
	With Plain Rest	With Compound Rest		Dimensions	Revolutions	With Plain Rest	With Compound Rest
	Inches	Inches	Feet	Inches			
1	1	5	16	18 x 6½	380	HANDSPEAR	HANDSHOES
1	1	5	18	18 x 6½	380	HANDSPIES	HANDSICHEL
1	1	5	20	18 x [illegible]	380	HANDSPUIT	HANDSLAG
1	1	5	25	18 x 6½	380	HANDSTAB	HANDSLAGEN

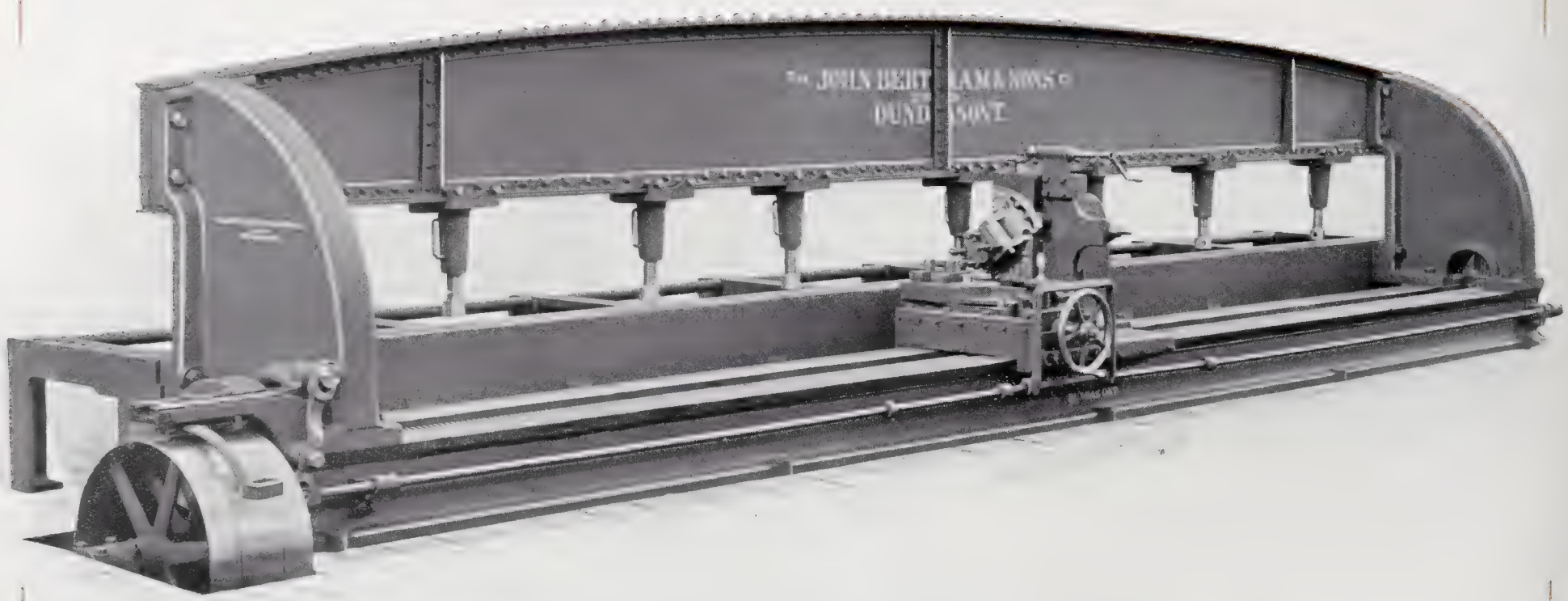


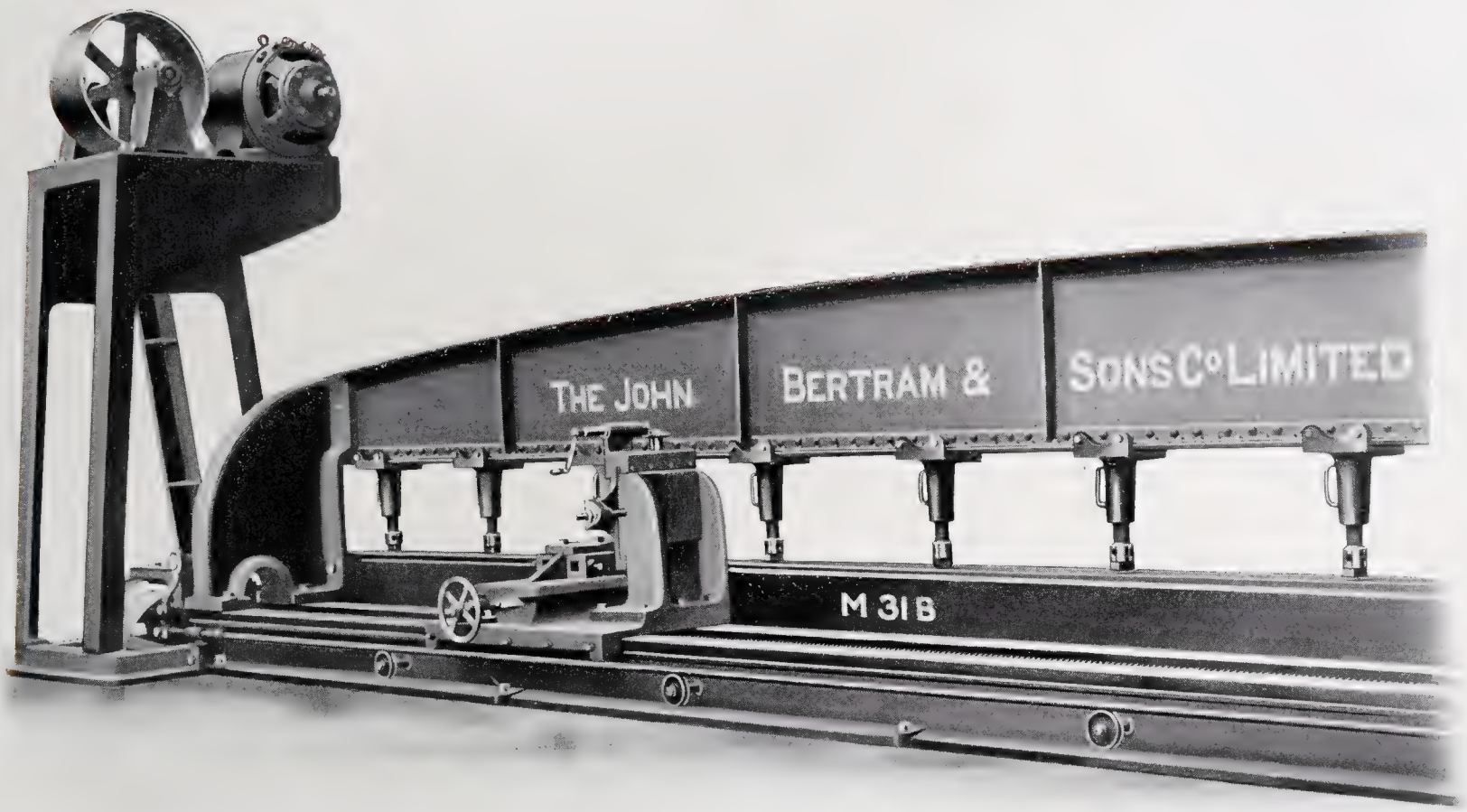
PLATE PLANING MACHINE

WITH COMPOUND REST

No. M-31

THIS machine is regularly built in four sizes for planing 16, 18, 20 and 25 feet long at one setting. Brackets carrying rollers extend the full length of the bed to support the plate.

	With Compound Rest
Code-Word, to plane 16 feet long.	HANDSHOES
Code-Word, to plane 18 feet long. .	. . HANDSICHEL
Code-Word, to plane 20 feet long . .	. . HANDSLAG
Code-Word, to plane 25 feet long . .	. . HANDSLAGEN
Code-Word, for direct-connected motor	. . ICEBERG



HEAVY PLATE PLANING MACHINE

MOTOR DRIVEN

No. M-31 B

THIS machine is regularly built in four sizes for planing 16, 18, 20 and 25 feet long. The carriage carries two cutting-slides, one with horizontal movement and one with both horizontal and vertical movement. The machine is driven by motor-geared countershaft or by reversing motor connected to the driving mechanism by friction clutch.

	With Plain Rest
Code-Word, to plane 16 feet long	HANDSPEAR
Code-Word, to plane 18 feet long	HANDSPIES
Code-Word, to plane 20 feet long	HANDSPUIT
Code-Word, to plane 25 feet long	HANDSTAB
Code-Word, for direct-connected motor	ICEBERG

PLATE BENDING ROLLS

BENDING ROLLS

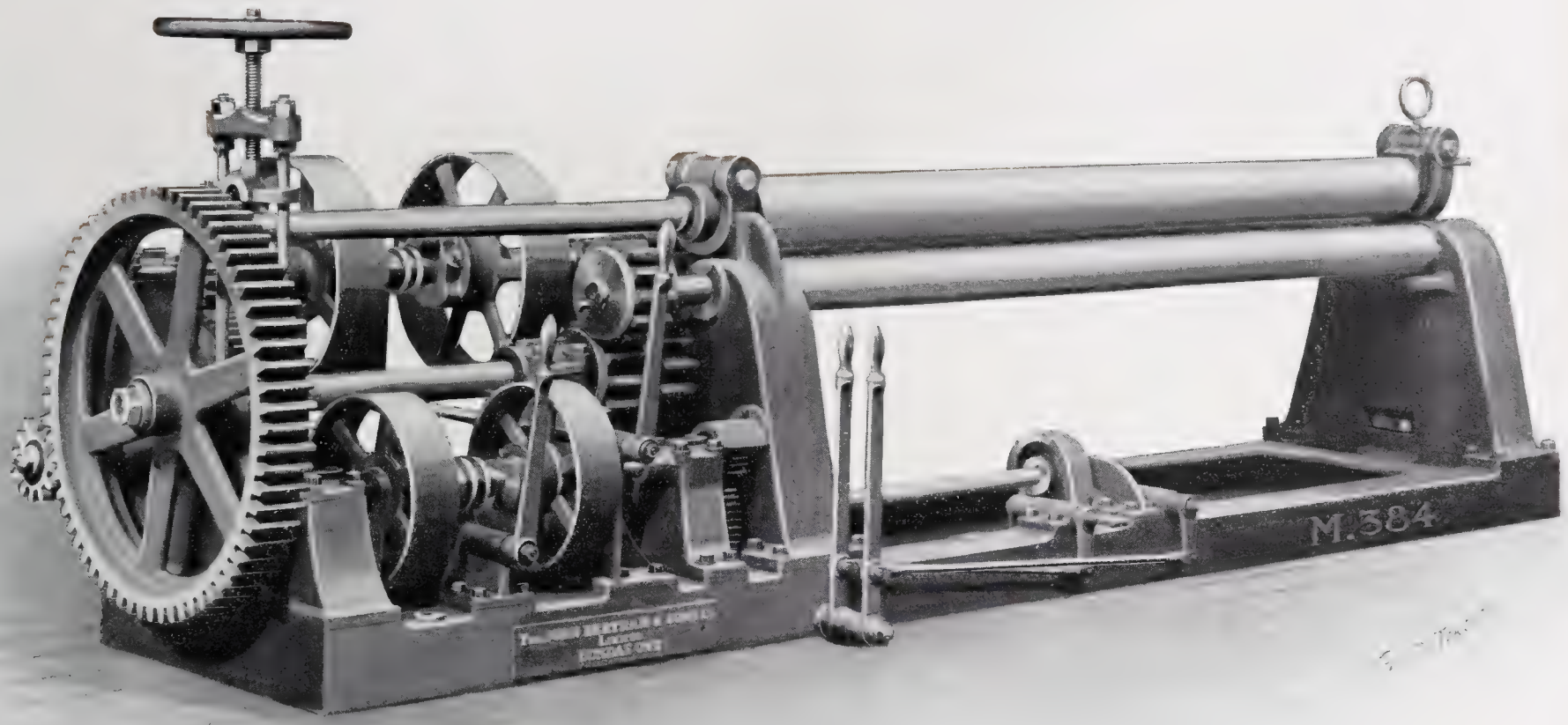
THESE machines are built in sizes for plates from 4 feet wide and $\frac{3}{16}$ of an inch thick to 20 feet wide and ½ inch thick. The standard design consists of three rolls arranged in pyramid form. The two lower rolls are geared; the upper roll is operated by the friction of the plate being bent and may be raised and lowered according to the requirements of the work. On large sizes the adjustment is by power. One bearing of the upper roll is hinged and may be thrown back to leave the roll free for the removal of a plate rolled to a full circle. On the large machines intermediate supports for the rolls are provided. Steel gearing is used wherever necessary, and a heavy bed-plate supports the machine its entire length.

BENDING ROLLS

No. 2 M-361

BUILT in three sizes, for plates 4 feet wide and ¼ of an inch thick; 5 feet wide and $\frac{3}{16}$ of an inch thick; 6 feet wide and ⅛ of an inch thick. The rolls are steel forgings arranged in pyramid form. The two lower rolls are geared together with steel pinions and driven by reversing-countershaft. The upper roll is raised and lowered by hand, extended for counterbalancing, and the outer-bearing is hinged for the removal of plates rolled to a full circle.

Code-Word, for plates 4 feet x ¼ inch, belt driven . . . . . FROGAR
Code-Word, for plates 5 feet x $\frac{3}{16}$ inch, belt driven . . . . . FROGARAS
Code-Word, for plates 6 feet x ⅛ inch, belt driven . . . . . FROGARIAN

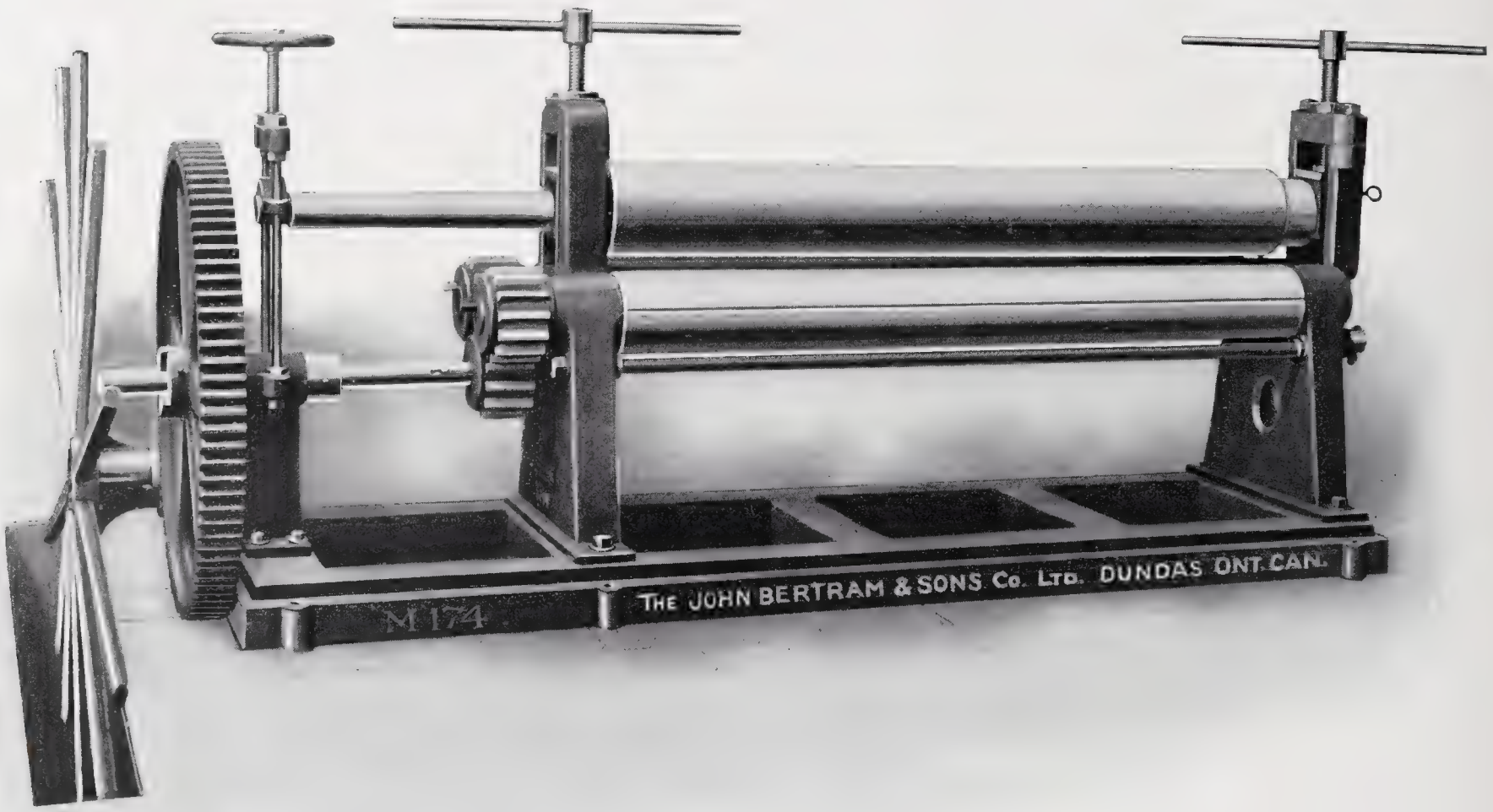


BENDING ROLLS

No. 3 M-384

BUILT in three sizes, for plates 4 feet wide and $\frac{3}{8}$ of an inch thick; 5 feet wide and $\frac{5}{16}$ of an inch thick; 6 feet wide and $\frac{1}{4}$ of an inch thick. The rolls are steel forgings arranged in pyramid form. The two lower rolls are geared together with steel pinions and driven by reversing-countershaft. The upper roll is raised and lowered by power, extended for counterbalancing, and the outer-bearing is hinged for the removal of plates rolled to a full circle.

Code-Word, for plates 4 feet x $\frac{3}{8}$ inch, belt driven . . . . . FROGASTE
Code-Word, for plates 5 feet x $\frac{5}{16}$ inch, belt driven . . . . . FROGCLOCK
Code-Word, for plates 6 feet x $\frac{1}{4}$ inch, belt driven . . . . . FROGEATER

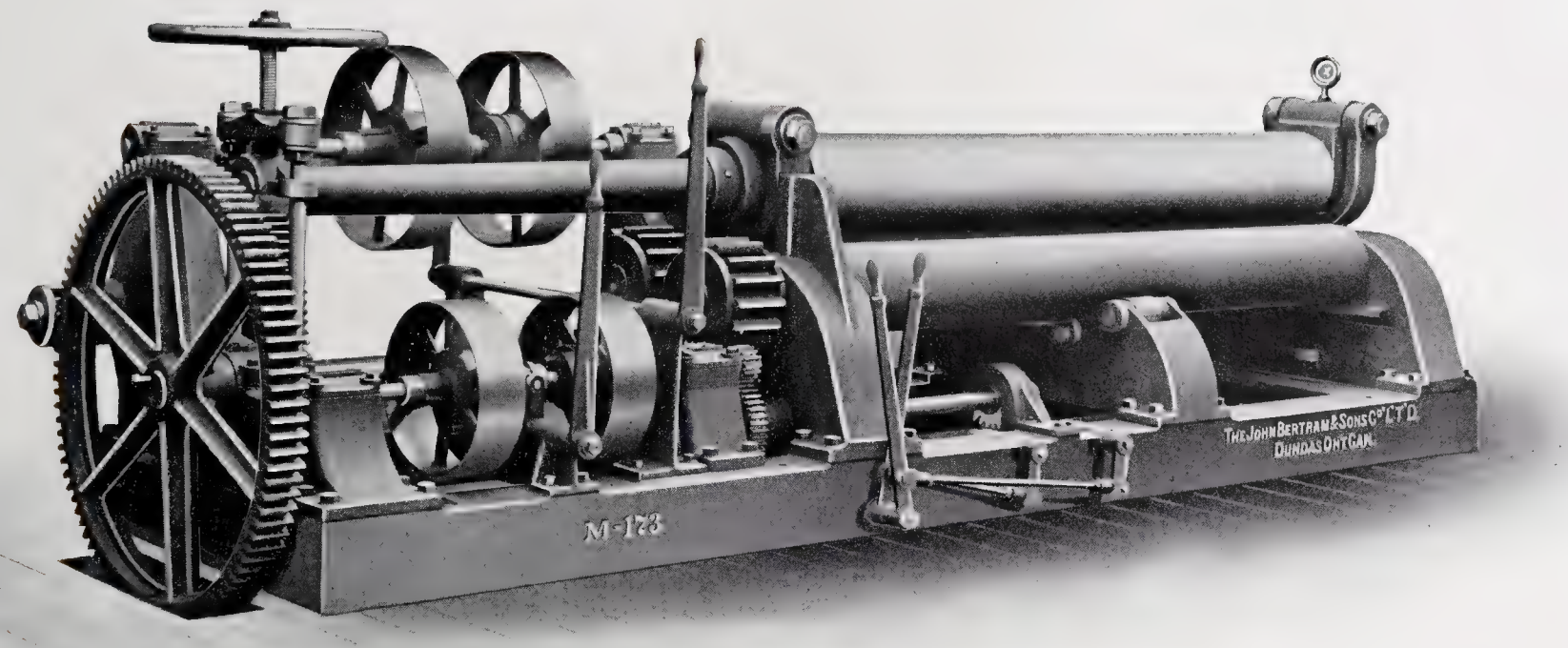


BENDING ROLLS

No. 5 M-174

For plates 6 feet wide and $\frac{9}{16}$ of an inch thick. The rolls are steel forgings and arranged in pyramid form. The lower rolls are geared together by steel pinions. The upper roll has hand-adjustment, is extended for counter-balancing, and the outer-bearing is hinged for the removal of plates rolled to a full circle.

Code-Word, for plates 6 feet x $\frac{9}{16}$ inch . . . . . FROGLIKE

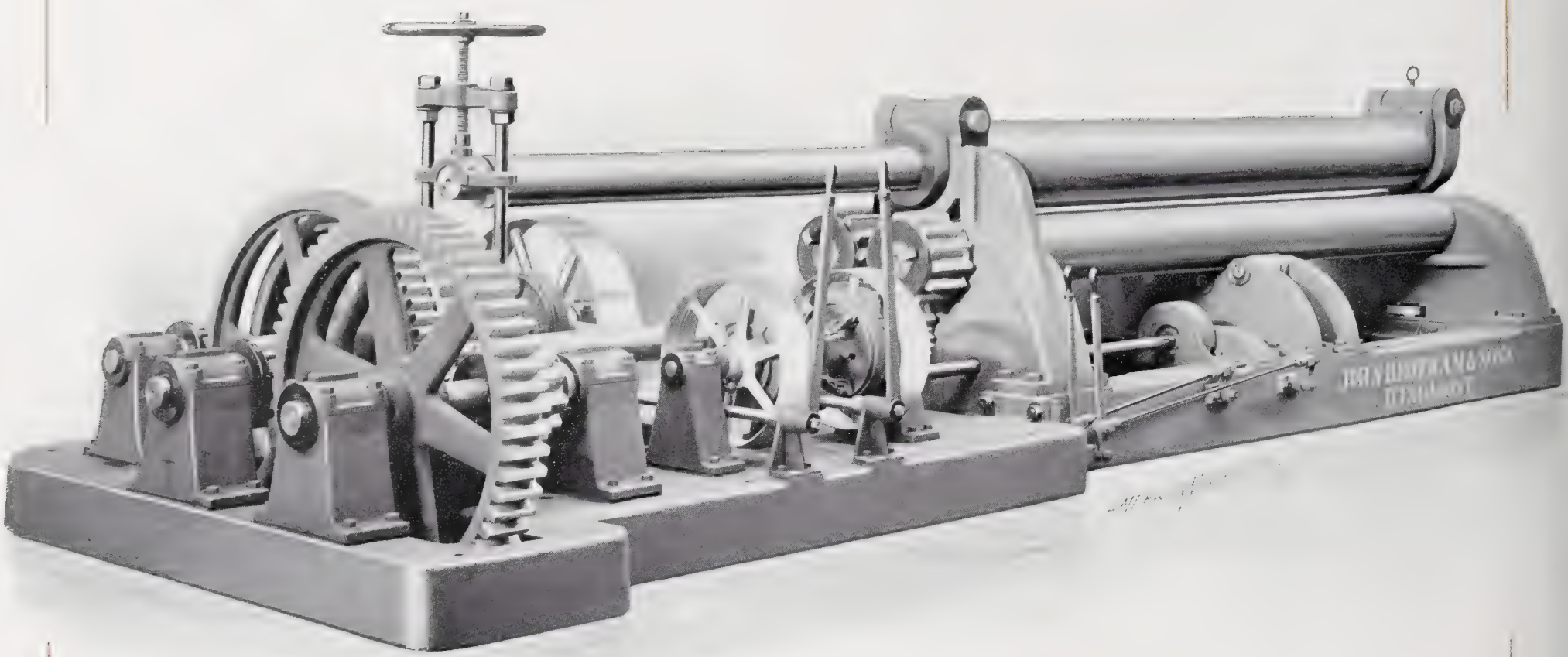


BENDING ROLLS

No. 7 M-173

BUILT in 18 sizes, for plates 6 feet wide and 1 inch thick, 8 feet wide and 7/8 of an inch thick; 10 feet wide and 3/4 of an inch thick; 12 feet wide and 5/8 of an inch thick; 14 feet wide and 1/2 of an inch thick; 16 feet wide and 3/8 of an inch thick. The rolls are arranged in pyramid form, the lower rolls being driven through gearing in either direction by reversing-countershaft. The upper roll is raised and lowered by power, extended for counterbalancing, and the outer-bearing is hinged for the removal of plates rolled to a full circle. When built 10 feet or more between the housings the lower rolls are provided with intermediate support.

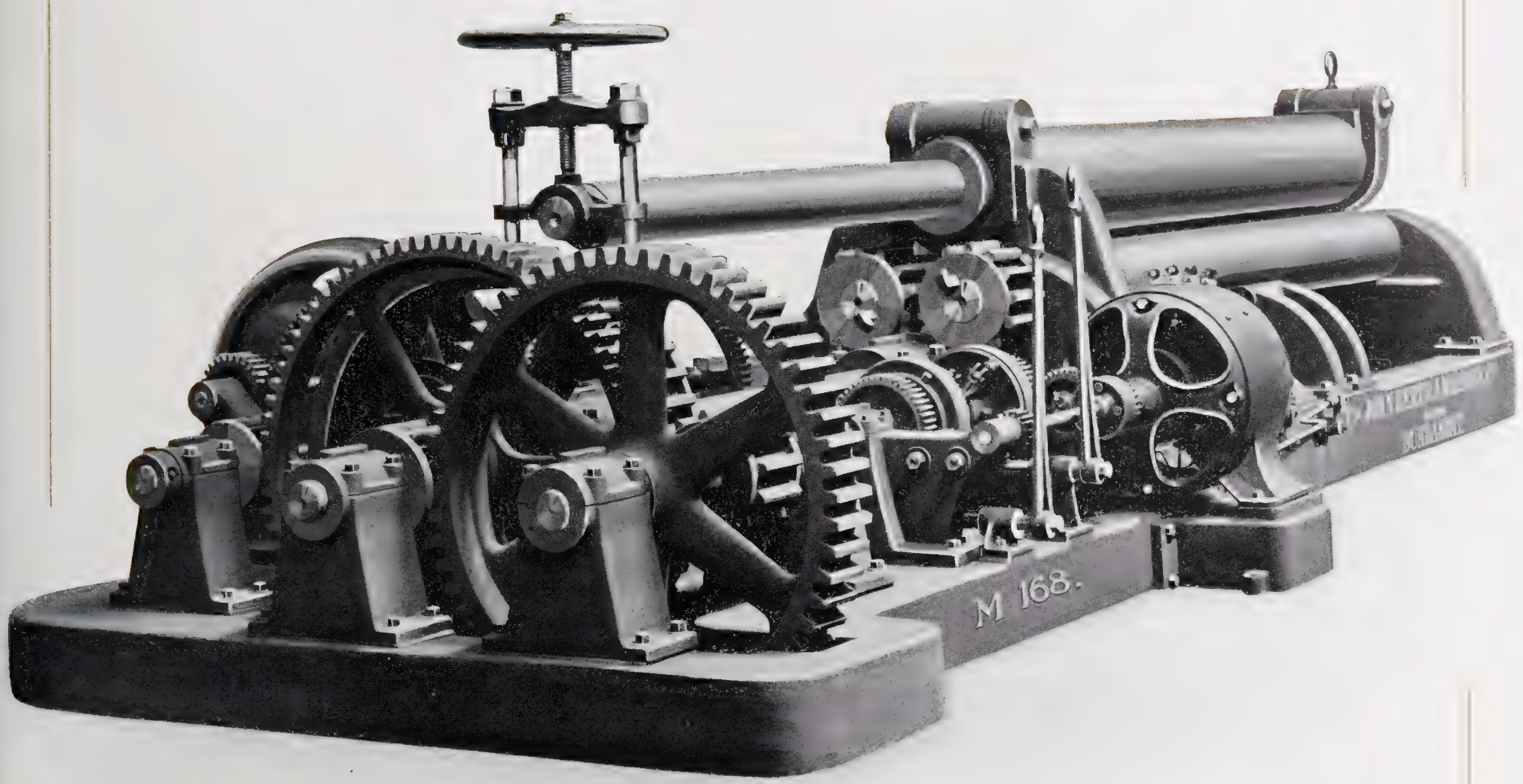
Code-Word, for plates 6 feet x 1 inch, belt driven	FROHLAUT
Code-Word, for plates 8 feet x 7/8 inch, belt driven	FROHLEBIG
Code-Word, for plates 10 feet x 3/4 inch, belt driven	FROHLICHER
Code-Word, for plates 12 feet x 5/8 inch, belt driven	FROHLOCKEN
Code-Word, for plates 14 feet x 1/2 inch, belt driven	FROHLOCKT
Code-Word, for plates 16 feet x 3/8 inch, belt driven	FROHNARTIG



BENDING ROLLS

No. 8 M-168

BUILT in six sizes, for plates 10 feet wide and 1 ½ inches thick; 12 feet wide and 1 inch thick; 14 feet wide and ⅞ of an inch thick; 16 feet wide and ¾ of an inch thick; 18 feet wide and ⅝ of an inch thick; 20 feet wide and ½ of an inch thick. The rolls are arranged in pyramid form, the lower roll being driven through gearing in either direction by reversing-countershaft When built 10 feet or more between the housings the lower rolls are provided with an intermediate support.



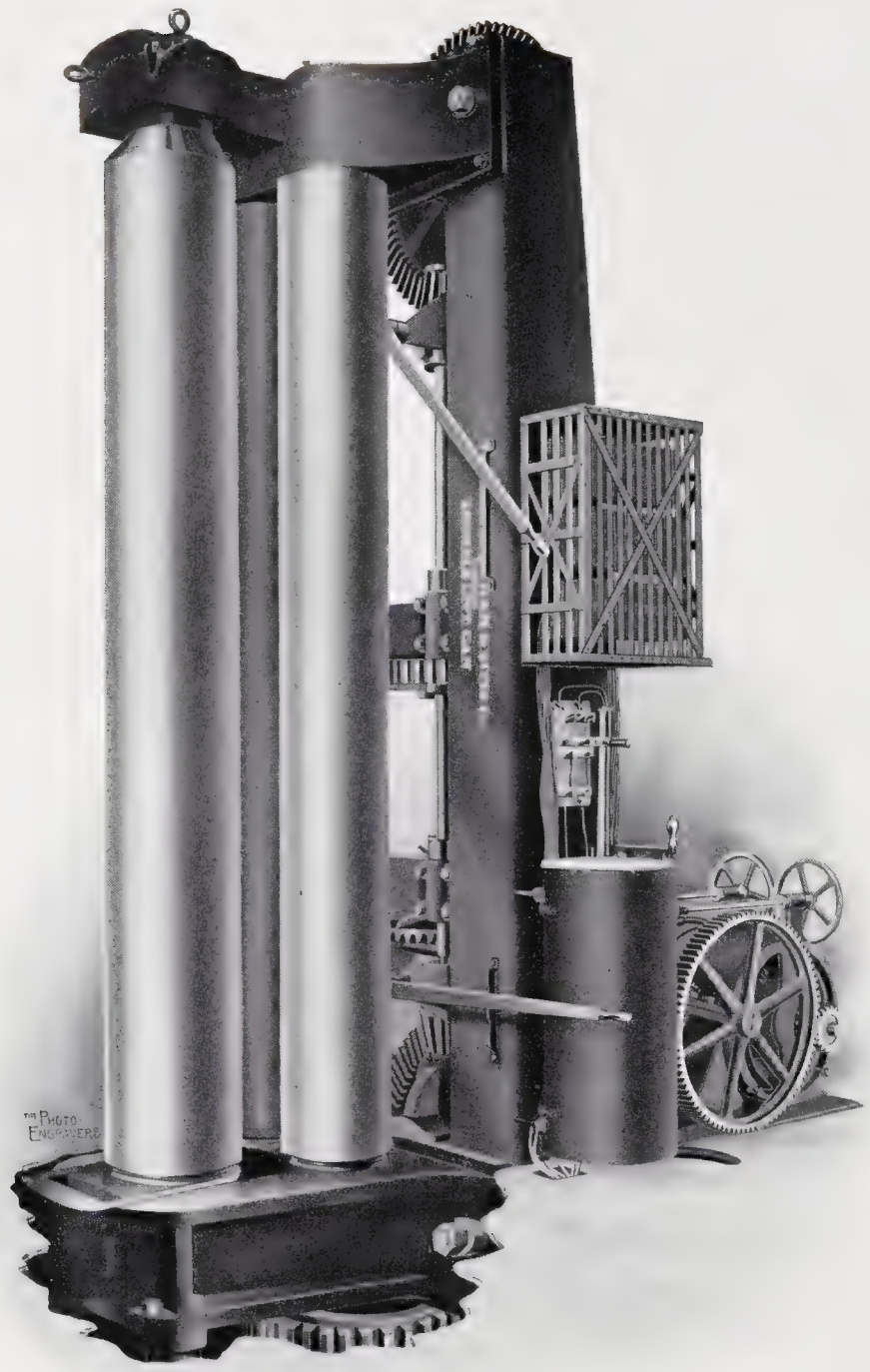
BENDING ROLLS

MOTOR DRIVEN

No. M-168 B

BUILT in six sizes, for plates 10 feet wide and 1⅛ inches thick; 12 feet wide and 1 inch thick; 14 feet wide and ⅞ of an inch thick; 16 feet wide and ¾ of an inch thick; 18 feet wide and ⅝ of an inch thick; 20 feet wide and ½ of an inch thick. The rolls are arranged in pyramid form. The two lower rolls are driven by a motor with reversing mechanism operated by clutches. The upper roll is raised and lowered by power, extended for counterbalancing, and the outer-bearing is hinged for the removal of plates rolled to a full circle.

Code-Word, for plates 10 feet x 1⅛ inches, belt driven	FROHNE
Code-Word, for plates 12 feet x 1 inch, belt driven	FROHNER
Code-Word, for plates 14 feet x ⅞ inch, belt driven	FROHERIN
Code-Word, for plates 16 feet x ¾ inch, belt driven	FROHNFEST
Code-Word, for plates 18 feet x ⅝ inch, belt driven	FROHGARTE
Code-Word, for plates 20 feet x ½ inch, belt driven	FROHNGEIST
Code-Word, for direct-connected motor	ICEBERG



VERTICAL BENDING ROLLS

No. M-354

THIS machine is built to bend steel plates 10 feet wide and 1½ inches thick; 12 feet wide and 1¼ inches thick. The machine is provided with three rolls. The two fixed rolls are positively driven in either direction by reversing motor. The bending roll is adjustable by power, and provided with suitable indicator to facilitate the setting. The upper bearing of bending roll is so arranged as to permit of the roll being raised clear of the housings for the removal of rings or flues. The gearing is placed beneath the floor and is driven by 50 H. P. reversing motor.

Code-Word, for plates 10 feet x 1½ inches. . . . . FROHNTEST
Code-Word, for plates 12 feet x 1¼ inches. . . . . FROHNUNG
Code-Word, for direct-connected motor . . . . . ICEBERG

STEAM HAMMERS

SINGLE AND DOUBLE FRAME STEAM HAMMERS

THE illustrations on the following pages represent our line of Single and Double Frame Steam Hammers. Owing to the wide variety only standard hammers are illustrated, but our line of patterns fully covers all modern forge requirements. They are simple in construction and built so that they are easily and conveniently handled.

All our hammers are rated according to the actual weight of falling parts,—thus a 500 lb. hammer means one whose ram, piston and top-die weigh 500 lbs. This takes no account of the top steam which increases the force of the blow, nor has it any reference to the actual weight of the hammer.

DIMENSIONS

SINGLE FRAME STEAM HAMMERS

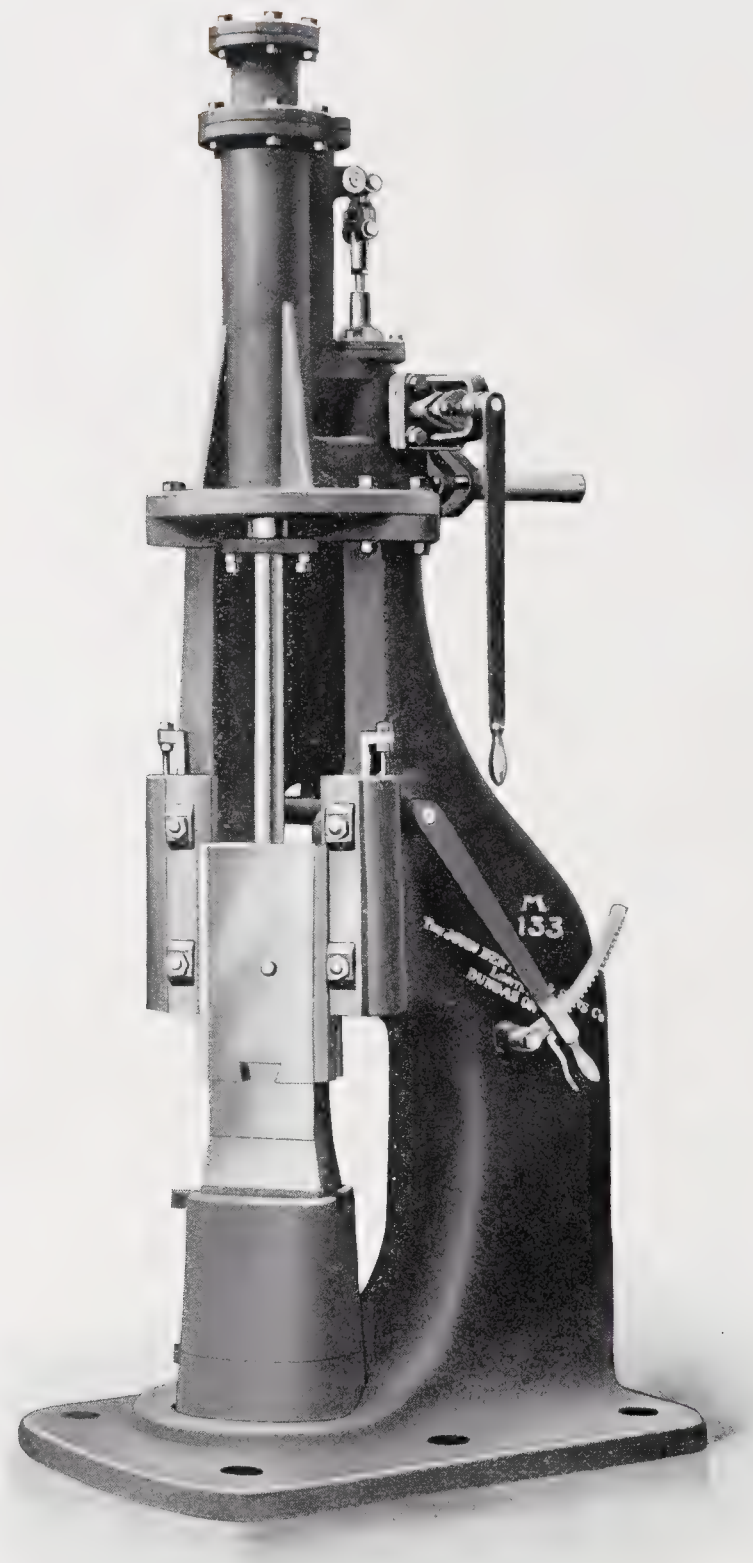
Rating of Hammer	Diameter of Cylinder	Stroke	Width Between Guides	Usual Die Surface	Code-Word With Anvil and Dies
Pounds	Inches	Inches	Inches	Inches	
350	5½	[illegible]	[illegible]	5 x 8½	GELONK
600	7	22	[illegible]	5 x 10	[illegible]
800	8	22	12½	5 x 12	[illegible]
1100	[illegible]	28	13½	5½ x 13	GELOSKOP
1500	[illegible]	[illegible]	[illegible]	6½ x 15	GELOTHE
2000	[illegible]	33	17	7 x 16½	[illegible]
2500	[illegible]	36	[illegible]	7½ x 17	[illegible]

LOCOMOTIVE PEDESTAL STEAM HAMMER

1800	13	[illegible]	[illegible]	[illegible] x 12	GEMARA

DOUBLE FRAME STEAM HAMMERS

2000	12	36	[illegible]	7½ x 16	GELUBEN
2500	14	[illegible]	19	8 x 18	GELUKKIG
3000	15	42	20	11 x 19	[illegible]
3500	16	[illegible]	[illegible]	11 x 20	GELURK
4000	17	48	22½	11 x 22	GELUSTIG
5000	[illegible]	48	24½	[illegible] x 24	GELZEST
6000	20	54	25½	14 x 25	GEMACHER

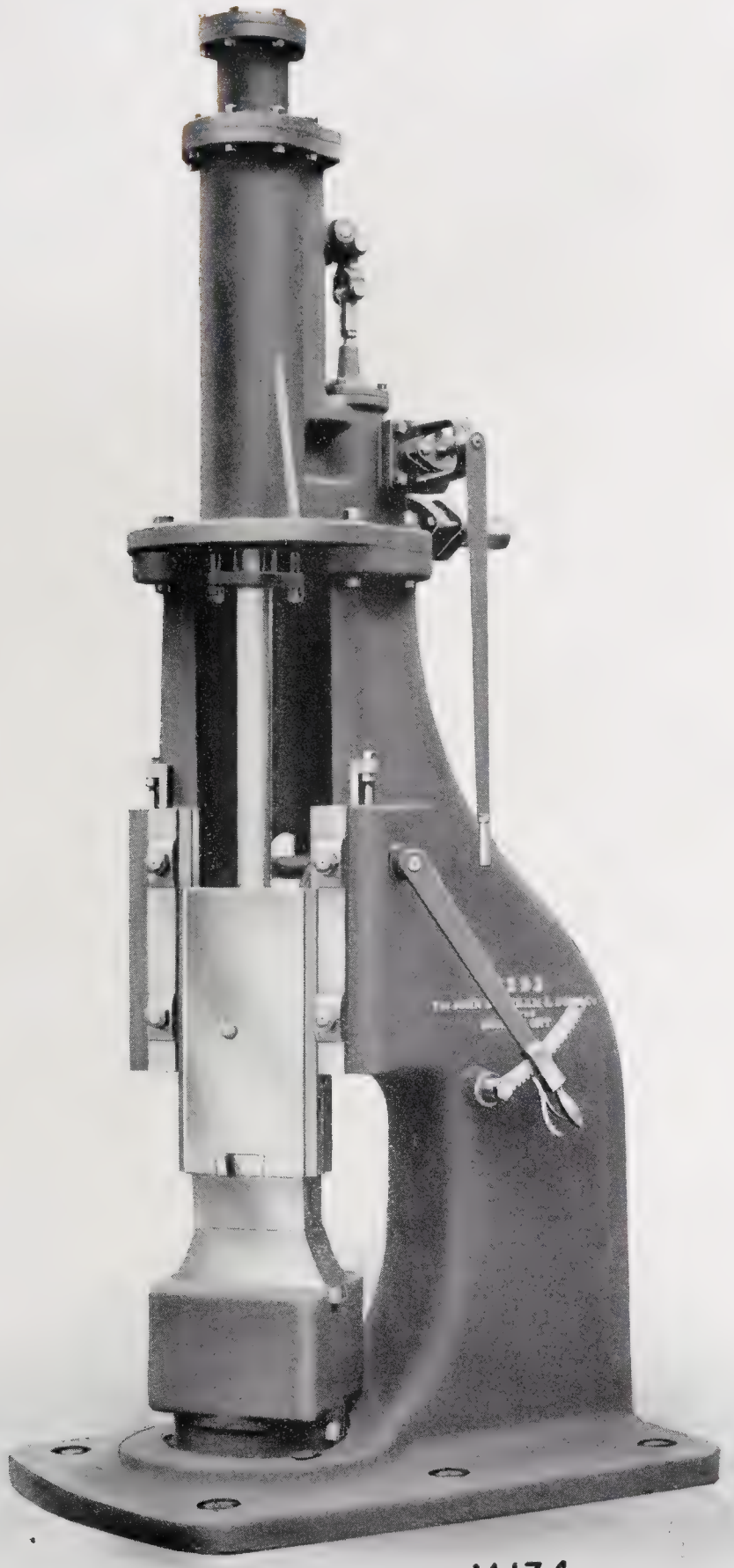


350 POUND SINGLE FRAME STEAM HAMMER

No. M-133

DIAMETER of cylinder, 5½ inches. Stroke, 18 inches. Width between guides, 8⅞ inches. Usual die surface, 5 x 8½ inches. With adjustable V guides for taking up wear and arranged to operate automatically or by hand.

Code-Word . . . . . GELONK

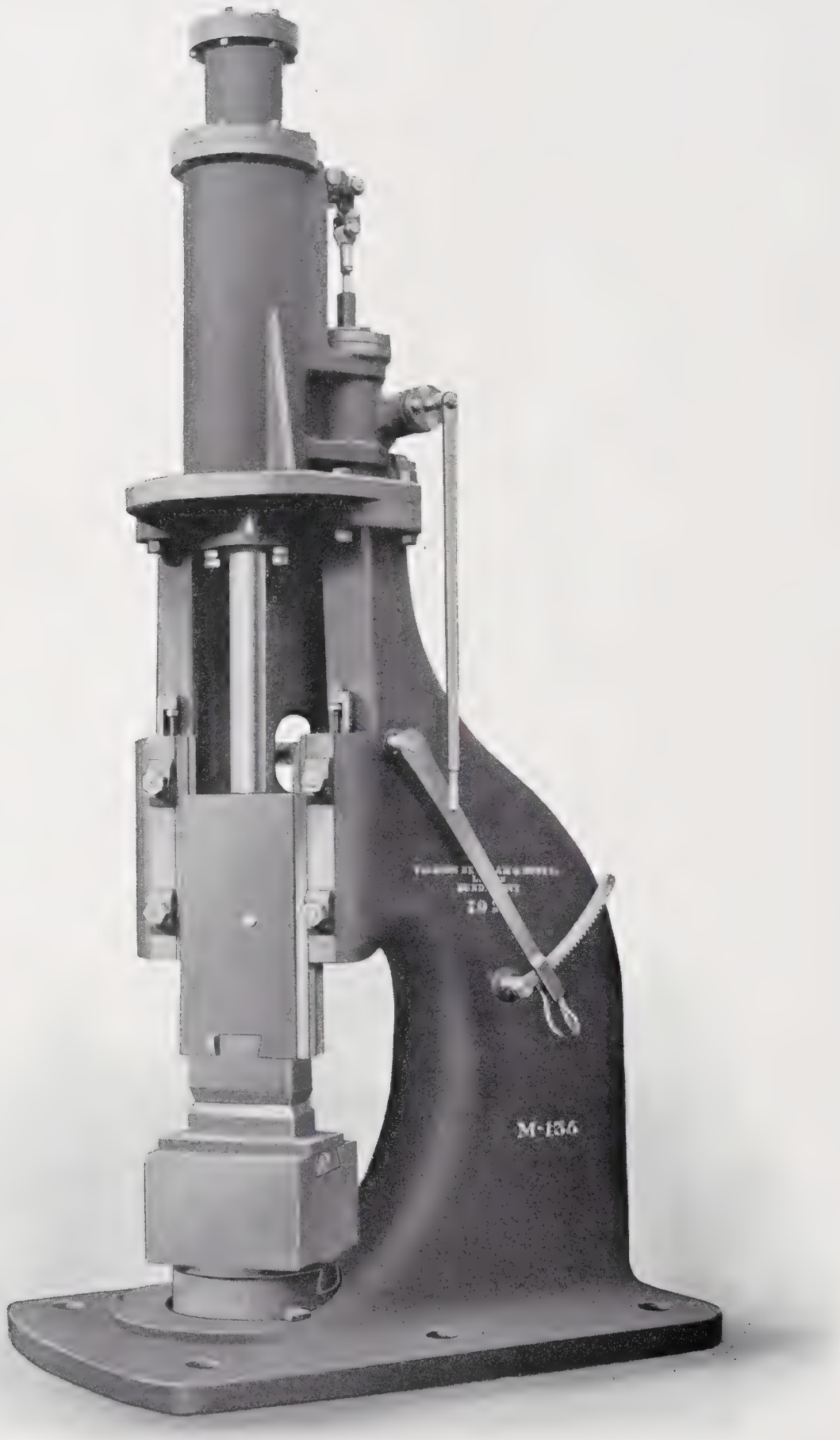


800-POUND SINGLE FRAME STEAM HAMMER

No. M-131

DIAMETER of cylinder, 8 inches. Stroke, 12 inches. Width between guides, 12½ inches. Usual die surface, 5 x 12 inches. With adjustable V guides for taking up wear and arranged to operate automatically or by hand.

Code-Word . . . . . GELORI



1100-POUND SINGLE FRAME STEAM HAMMER

No. M-135

DIAMETER of cylinder, 10 inches. Stroke, 28 inches. Width between guides, 13½ inches. Usual die surface, 13 x 5½ inches. With adjustable V guides for taking up wear and arranged to operate automatically or by hand.

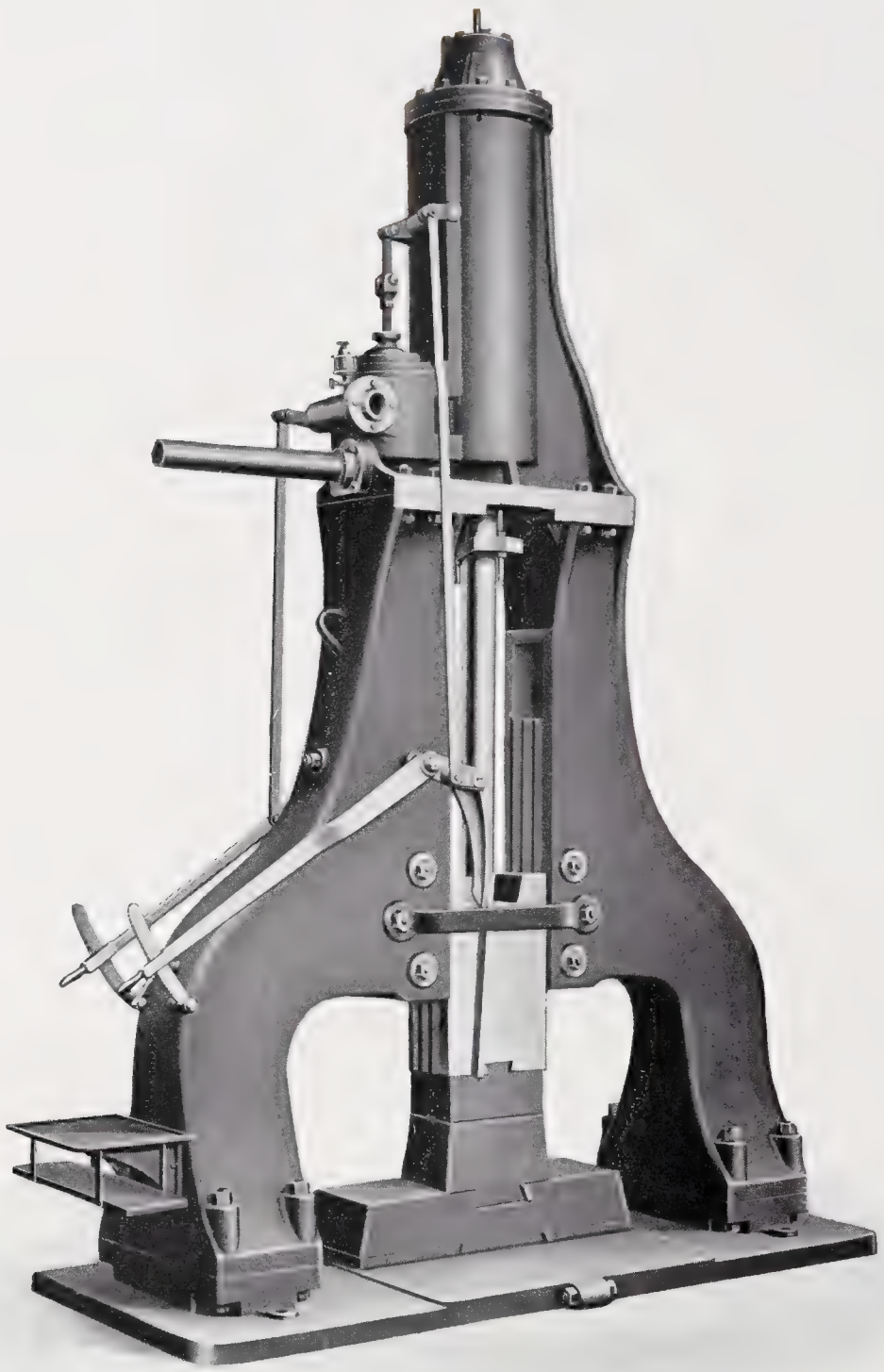
Code-Word . . . . . GELOSKOP

1800-POUND LOCOMOTIVE PEDESTAL STEAM HAMMER

No. M-139

DIAMETER of cylinder, 18 inches. Stroke, 33 inches. Length of anvil-face, 7 x 12 inches. Specially designed for forging irregular shapes, more particularly for welding pedestal-jaws on locomotive-frames. The hammer has an adjustable guide for taking up wear, which is placed close under the cylinder, leaving a space below equal to the entire stroke of the piston. Arranged to be operated automatically or by hand.

Code-Word . . . . . GEMARA



6000-POUND DOUBLE FRAME STEAM HAMMER

No. M-420

DIAMETER of cylinder, 20 inches. Stroke 54 inches. Width between guides, 25½ inches. Usual die surface, 14 x 25 inches. With adjustable V guides for taking up wear and arranged to operate automatically or by hand.

Code-Word . . . . . GEMACHER

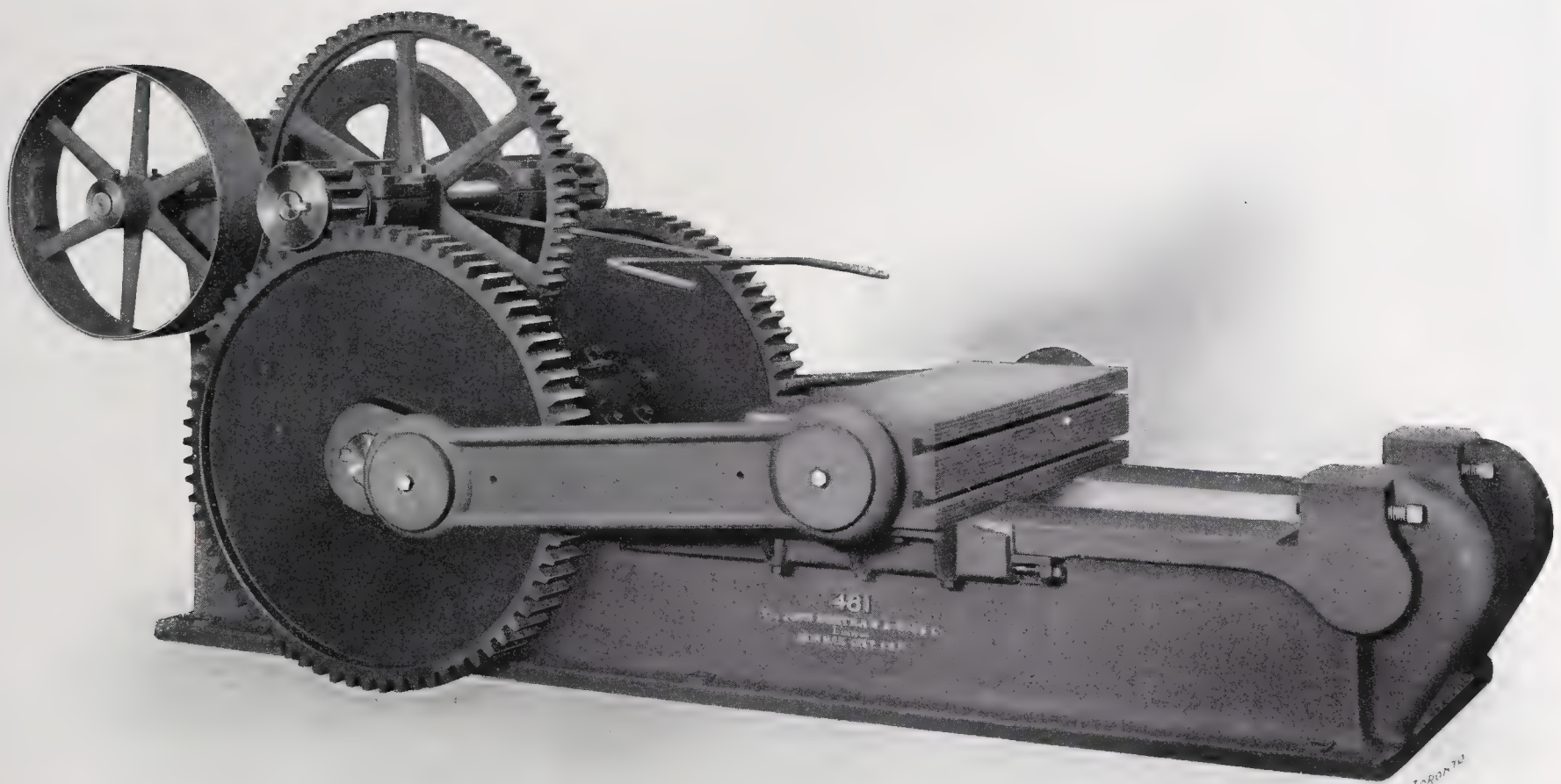
HORIZONTAL FORMING AND BENDING MACHINES

HORIZONTAL FORMING AND BENDING MACHINES

The illustration on opposite page represents our standard Horizontal Forming and Bending Machines. Principal dimensions of the sizes we manufacture are given in the following table. Our Horizontal Forming and Bending Machines are all made with double gear, the top shaft running at a high rate of speed, with a comparatively slow movement of the crosshead. Machines are driven by belt or electric motor direct connected.

DIMENSIONS

No. of Machine	Length Over All	Width Over All	Face of Crosshead	Movement of Crosshead	Space for Dies with Crosshead Forward	Code-Word
	Ft. & In.	Ft. & In.	Inches	Inches	Inches	
4	10—8	4—7	45½ x 7½	18	[illegible]	GAUNCH
5	11—8	[illegible]	63½ x [illegible]	[illegible]	38	GAUNERN
6	[illegible]	6—3	[illegible]	20	[illegible]	GAUNTLET
7	15—5	6—9	70 x 16	22	48	GAUNTREE



No. 6 DOUBLE GEARED FORMING AND BENDING MACHINE

No. M-481

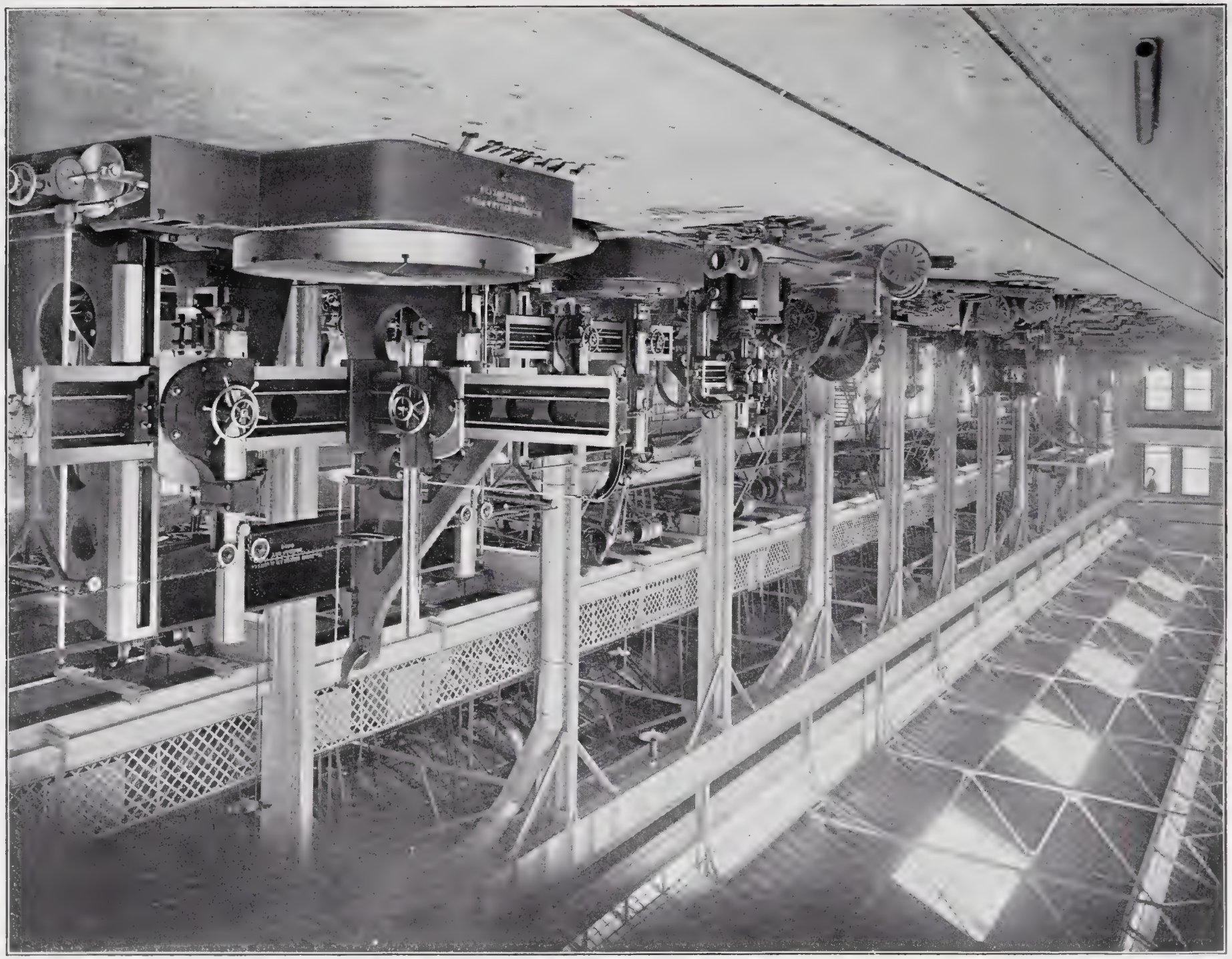
We furnish this machine either belt driven, operated by friction clutch or direct-connected motor as desired. For general dimensions see specifications on opposite page.

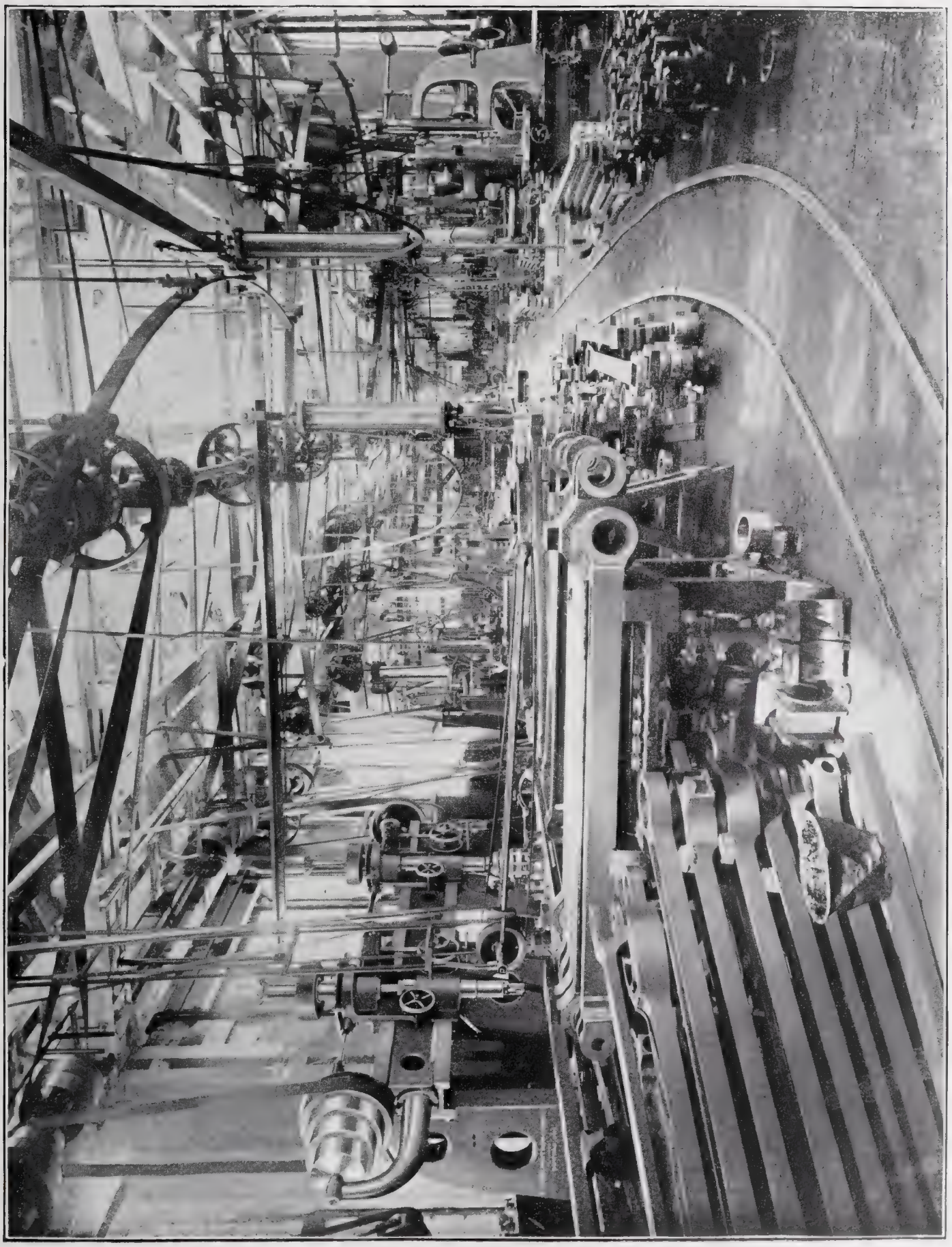
Code-Word . GAUNTLET

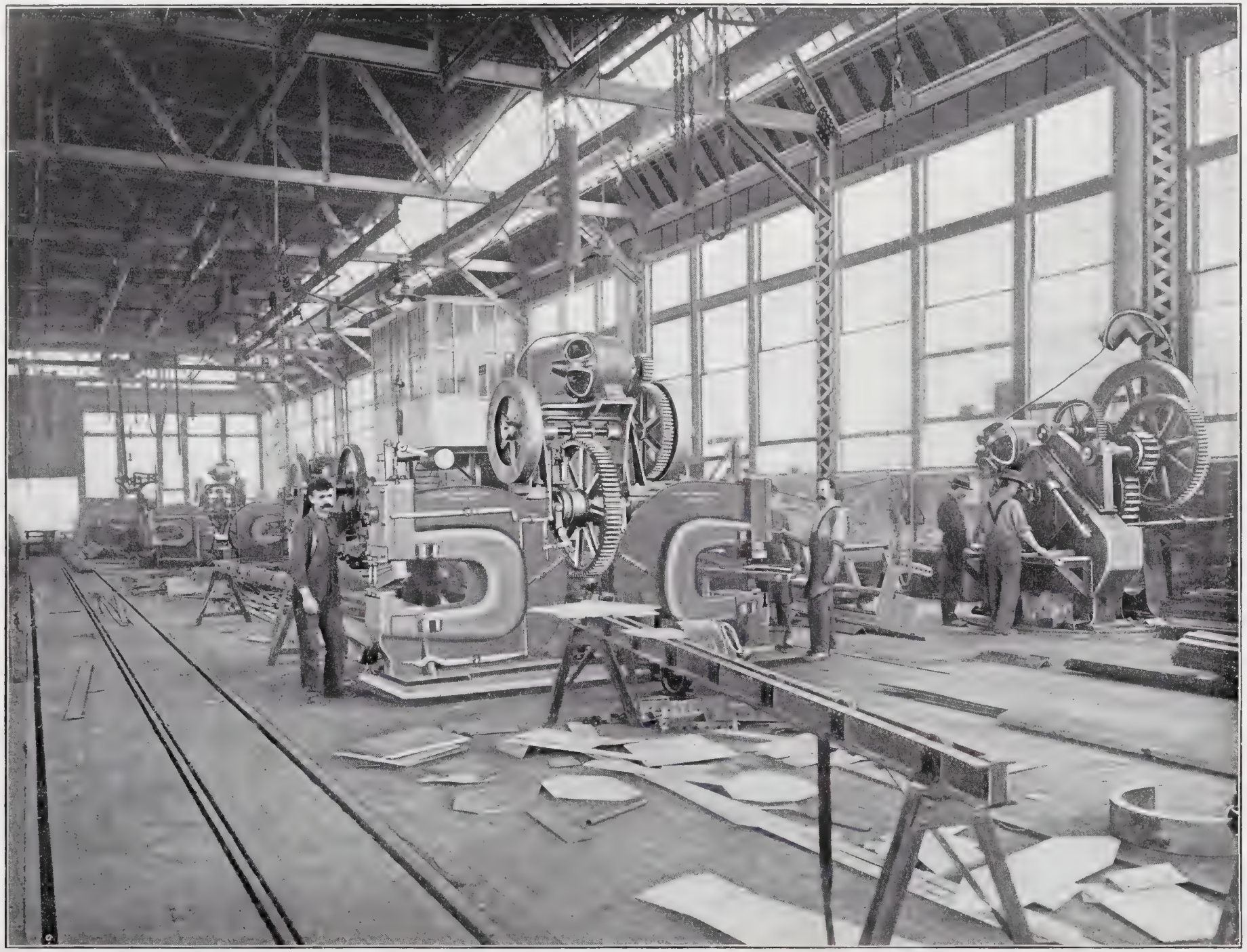
A FEW INTERIOR VIEWS

OUR tools are used extensively in a large number of shops throughout Canada,—many of them are equipped throughout with our product. The following views show some of the important works both at home and abroad equipped with our machinery.

THE JOHN LEE-WEST SUGAR REFINERIES COMPANY LIMITED

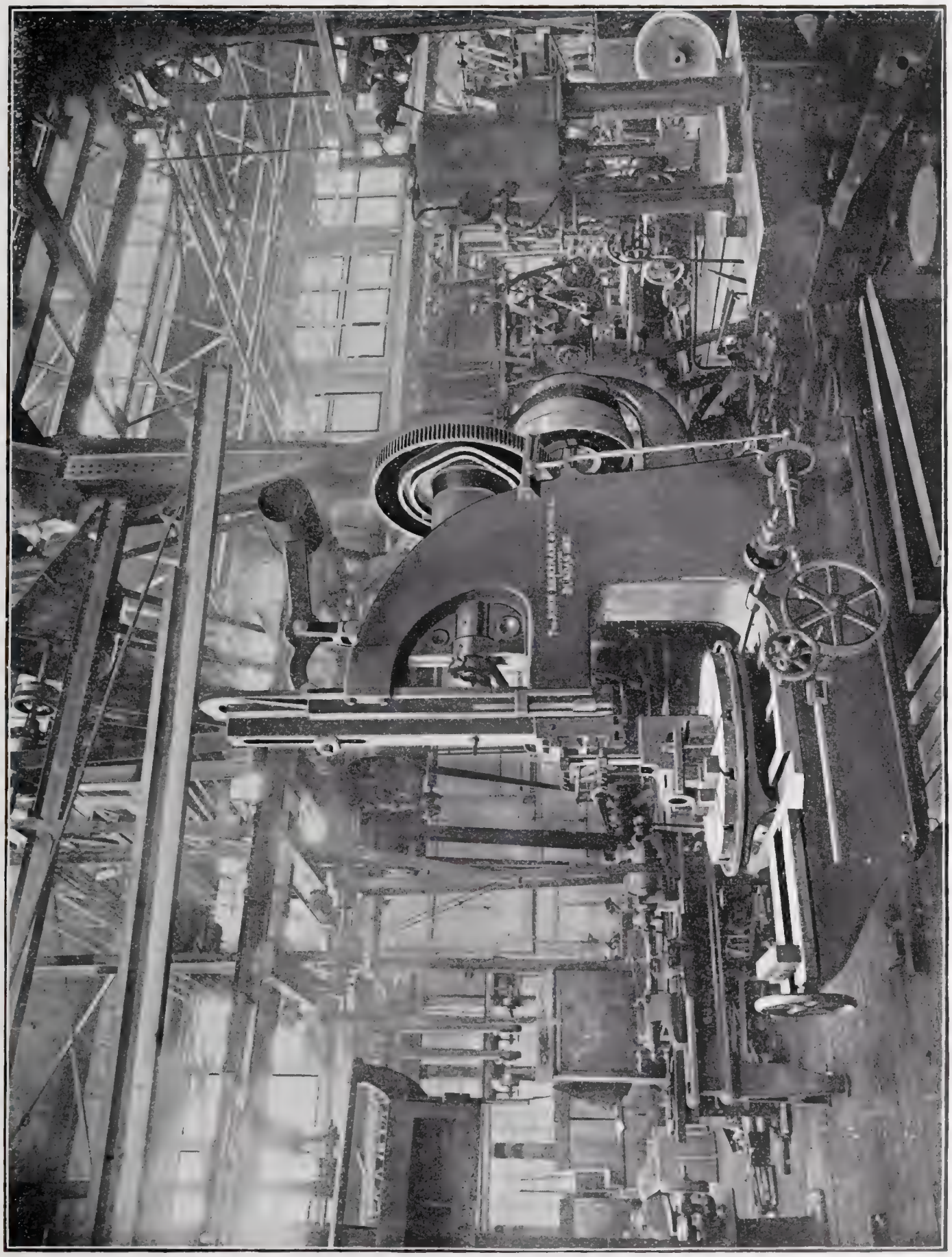


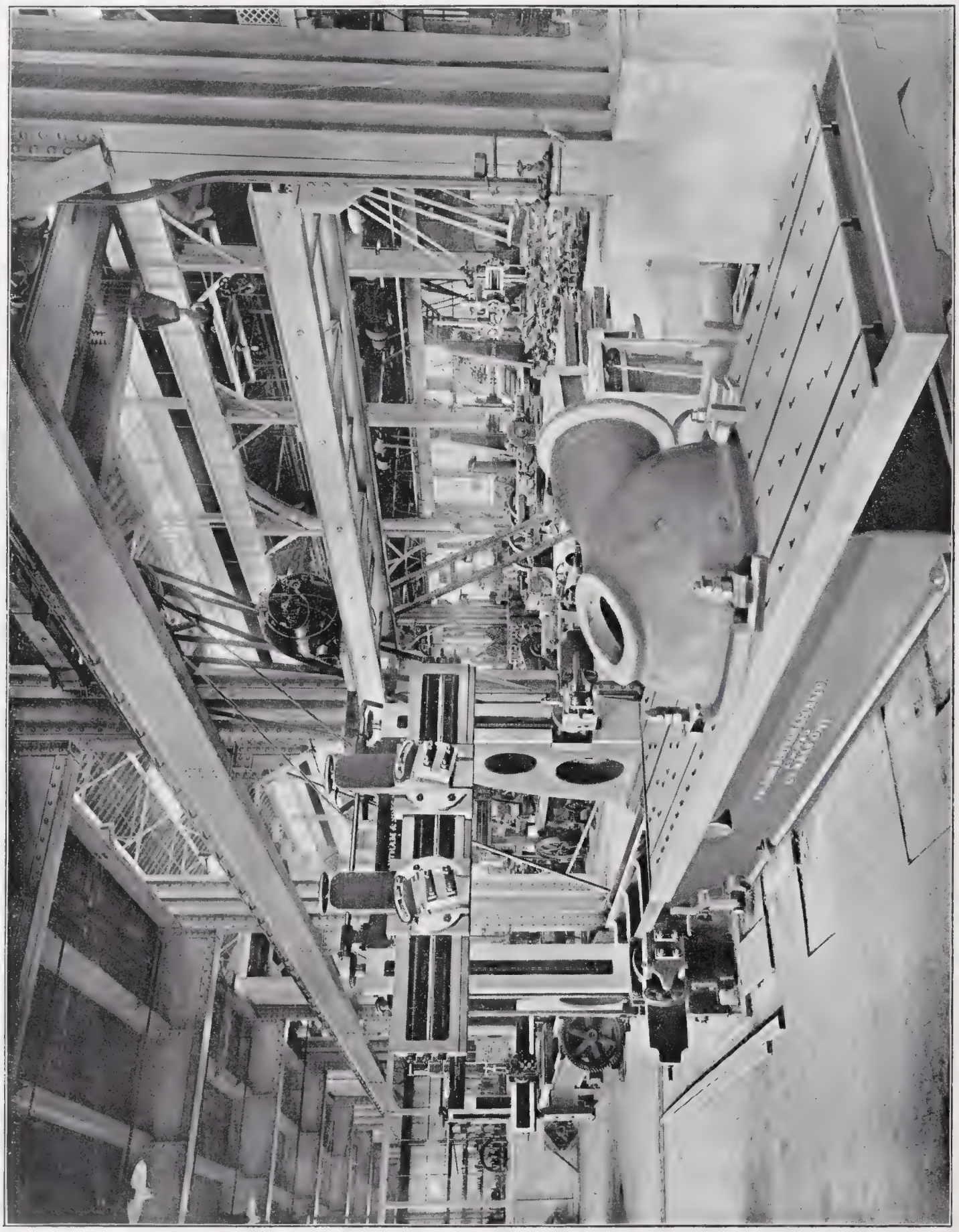


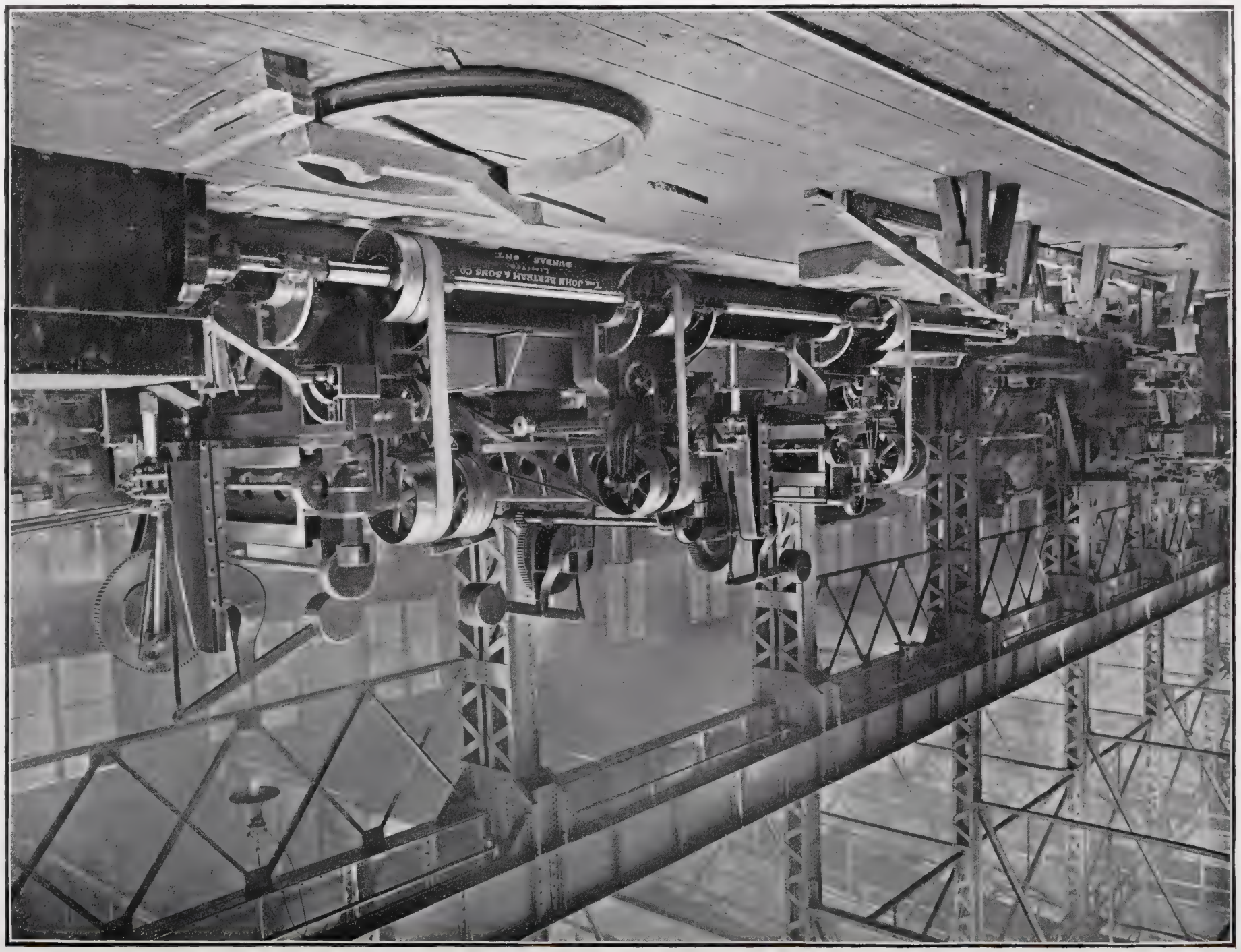


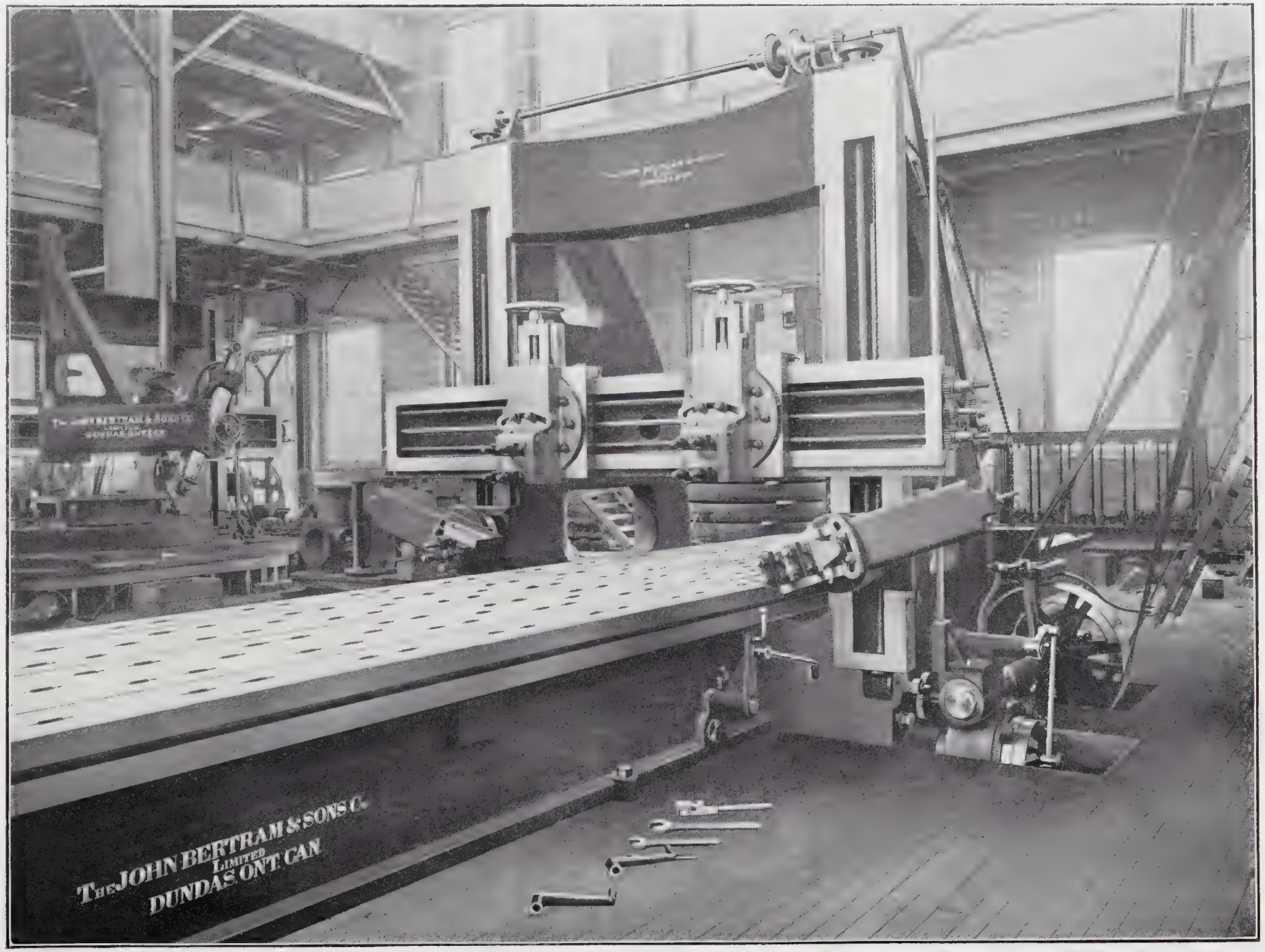
SHOWING BERTRAM PUNCHING AND SHEARING MACHINE.

JOHN BERTRAM & SONS COMPANY LIMITED






THE JOHN BERTRAM & SONS CO
LIMITED
DUNDAS, ONT.

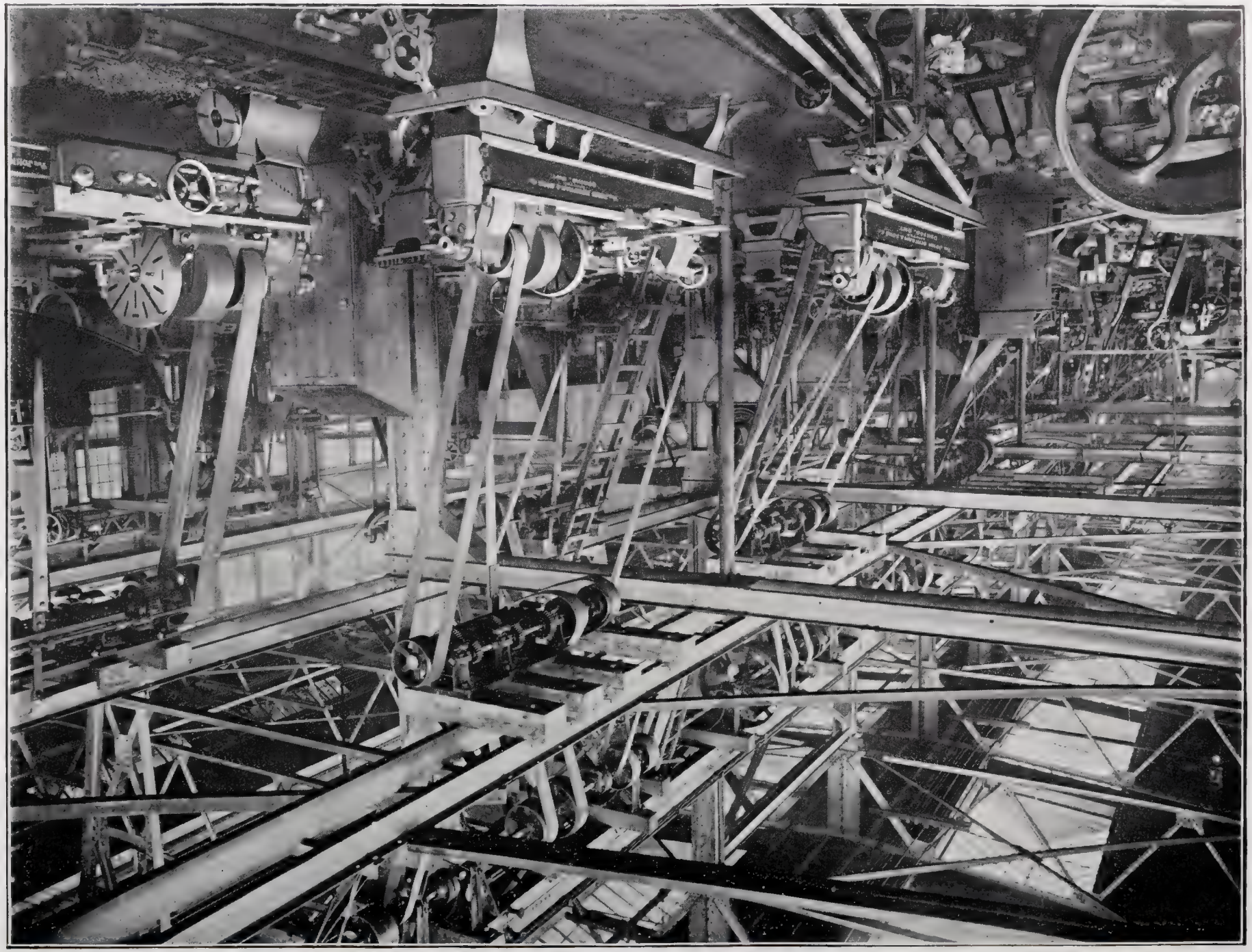


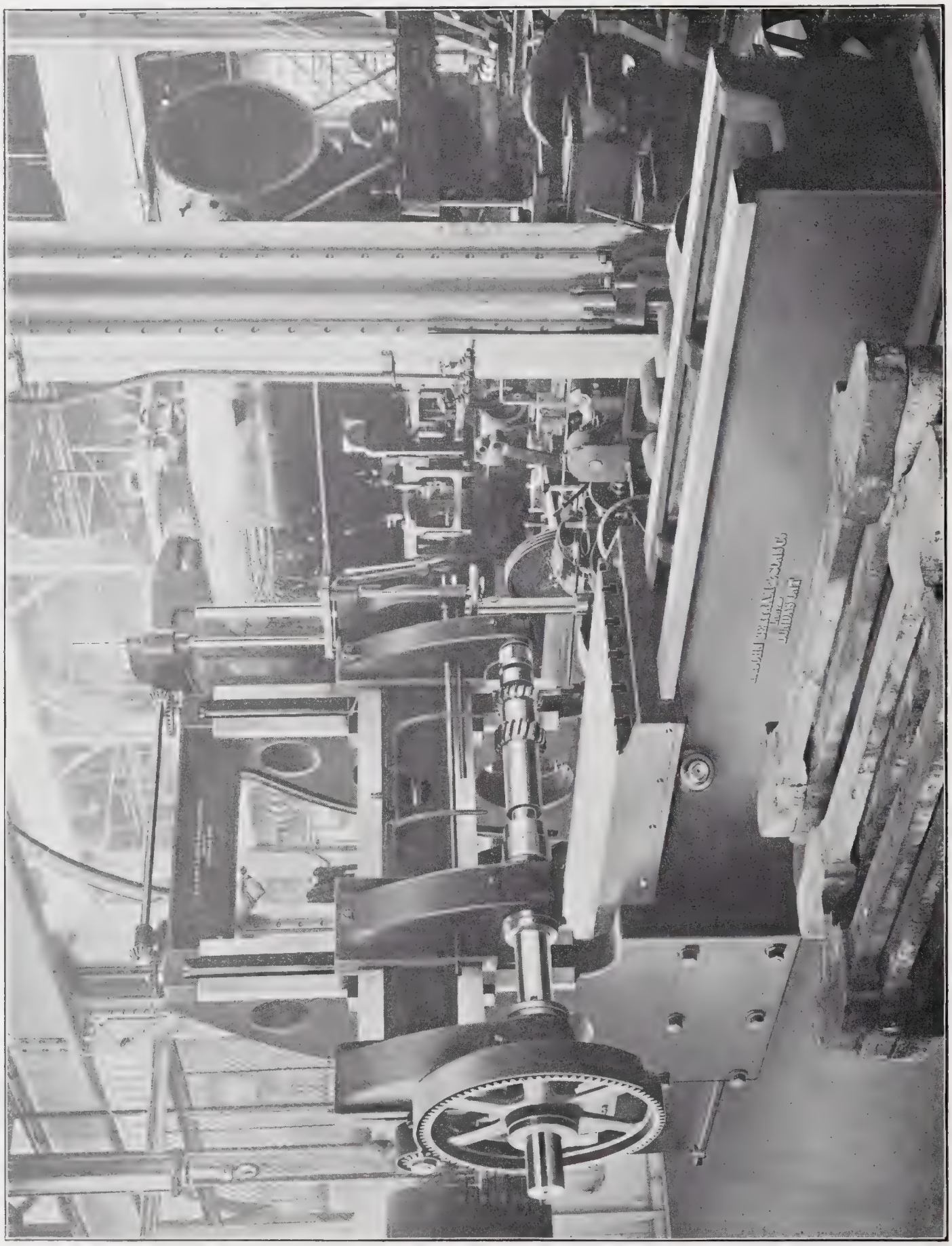
INTERIOR VIEW

SHOWING BERTRAM 84-INCH PLANER

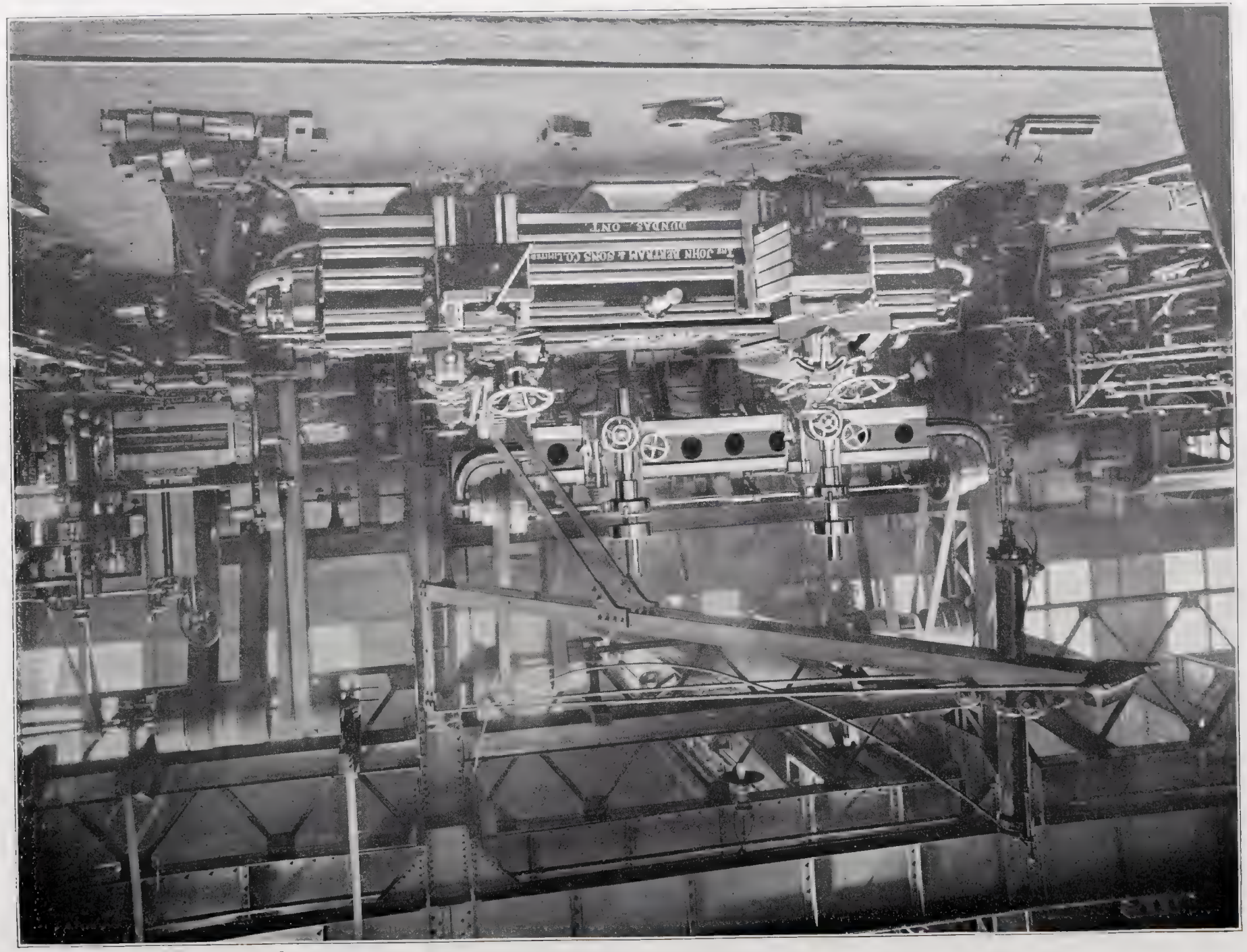
THE JOHN BERTRAM & SONS COMPANY, LIMITED

THE JOHN SOSS COMPANY, LIMITED

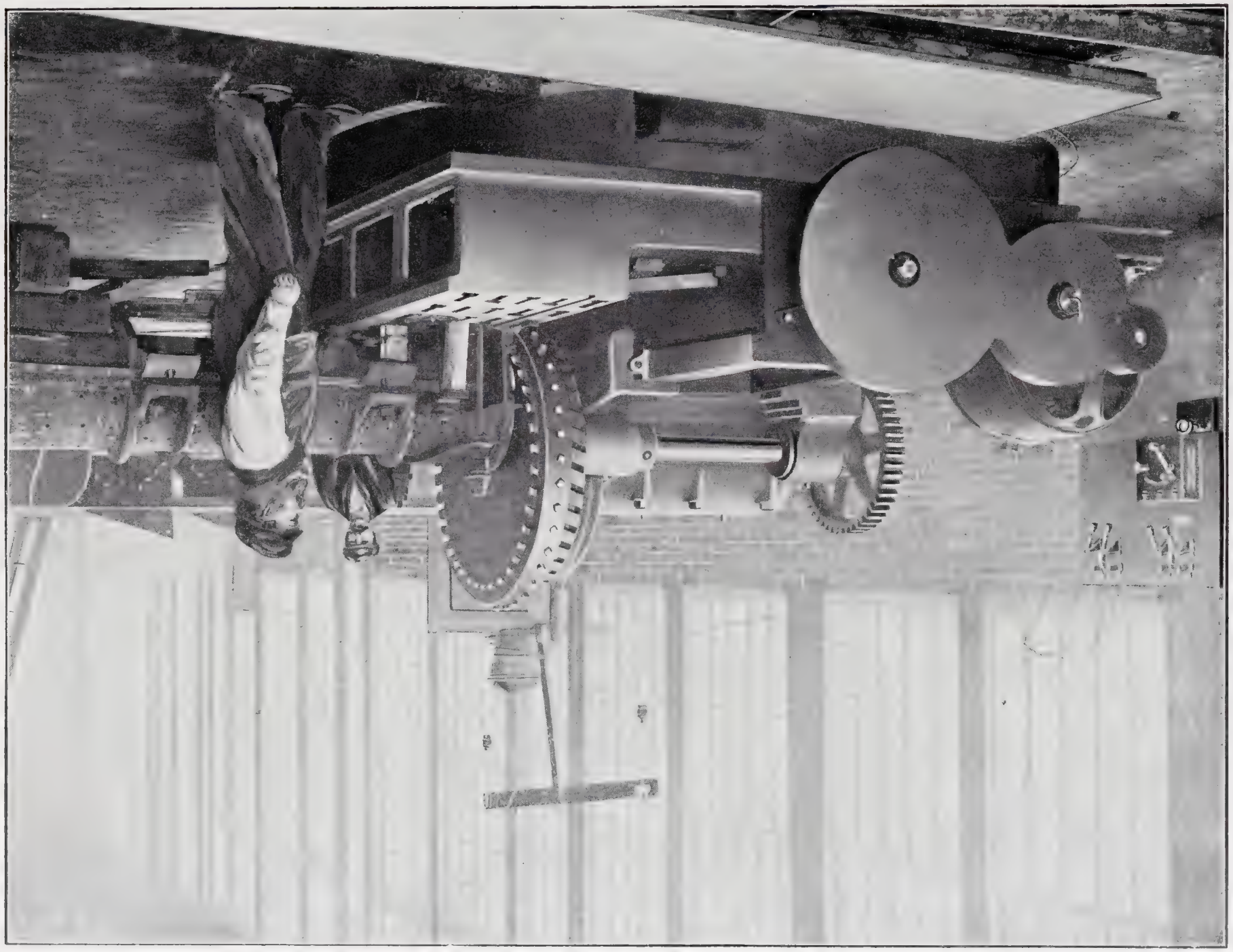


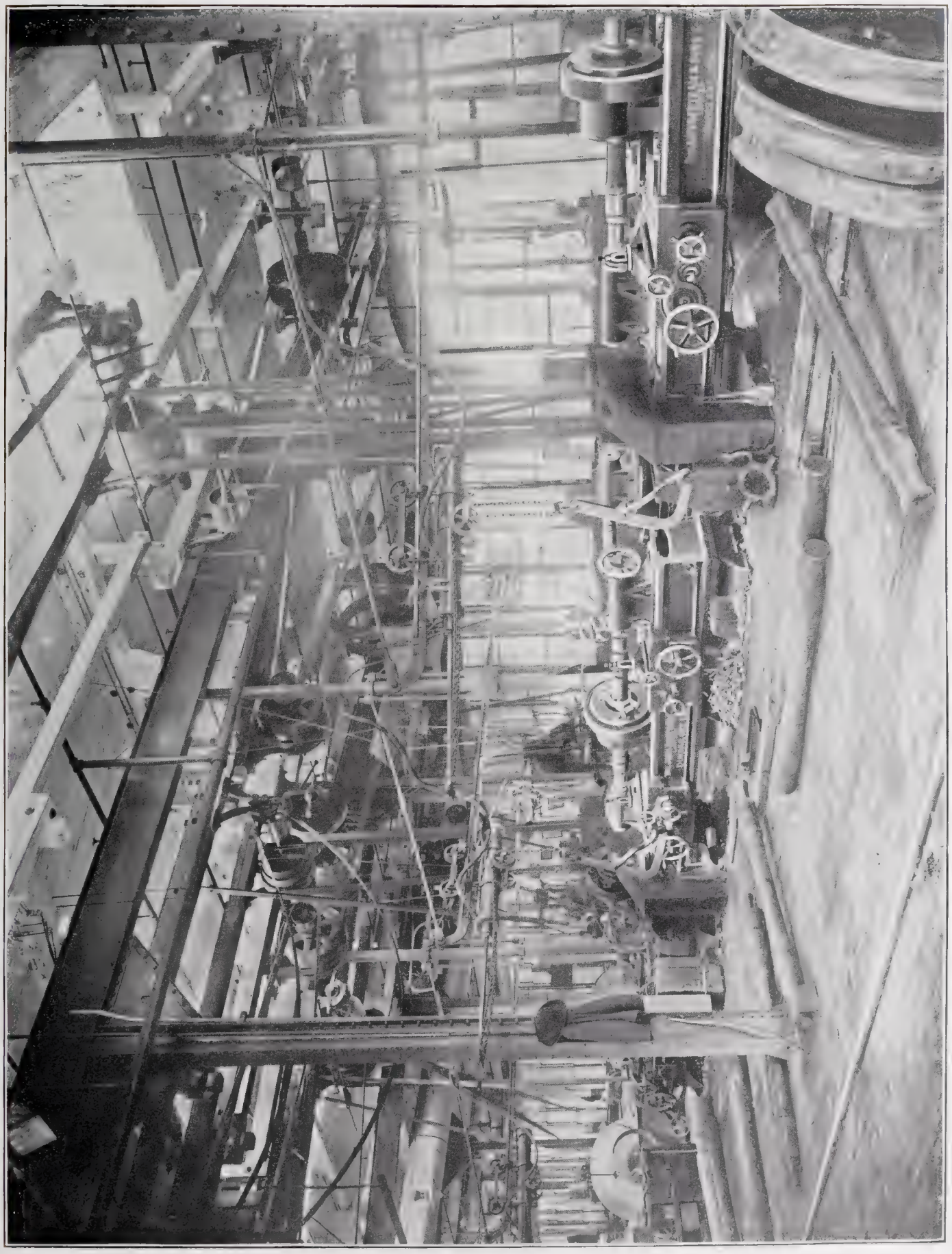


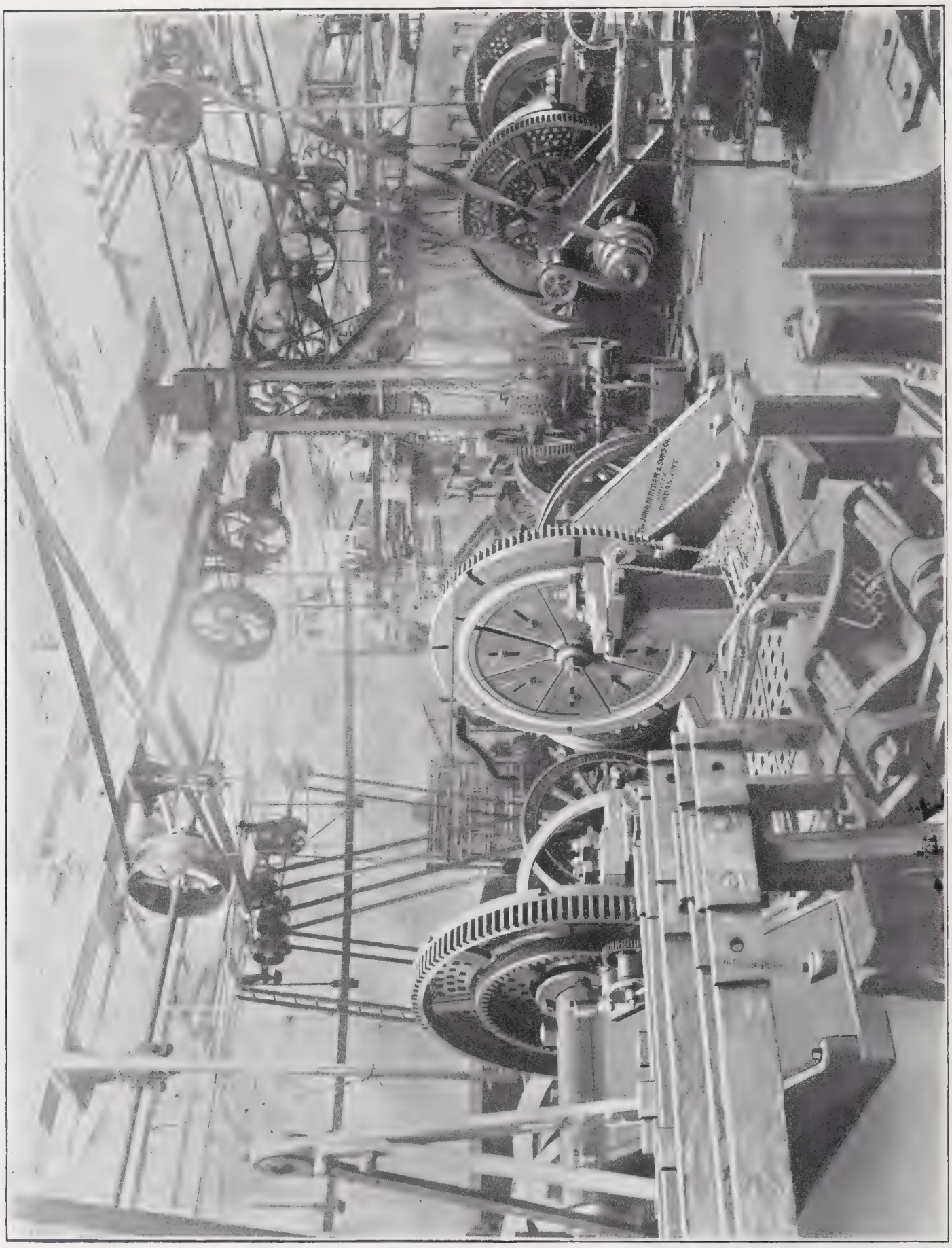
VIEW

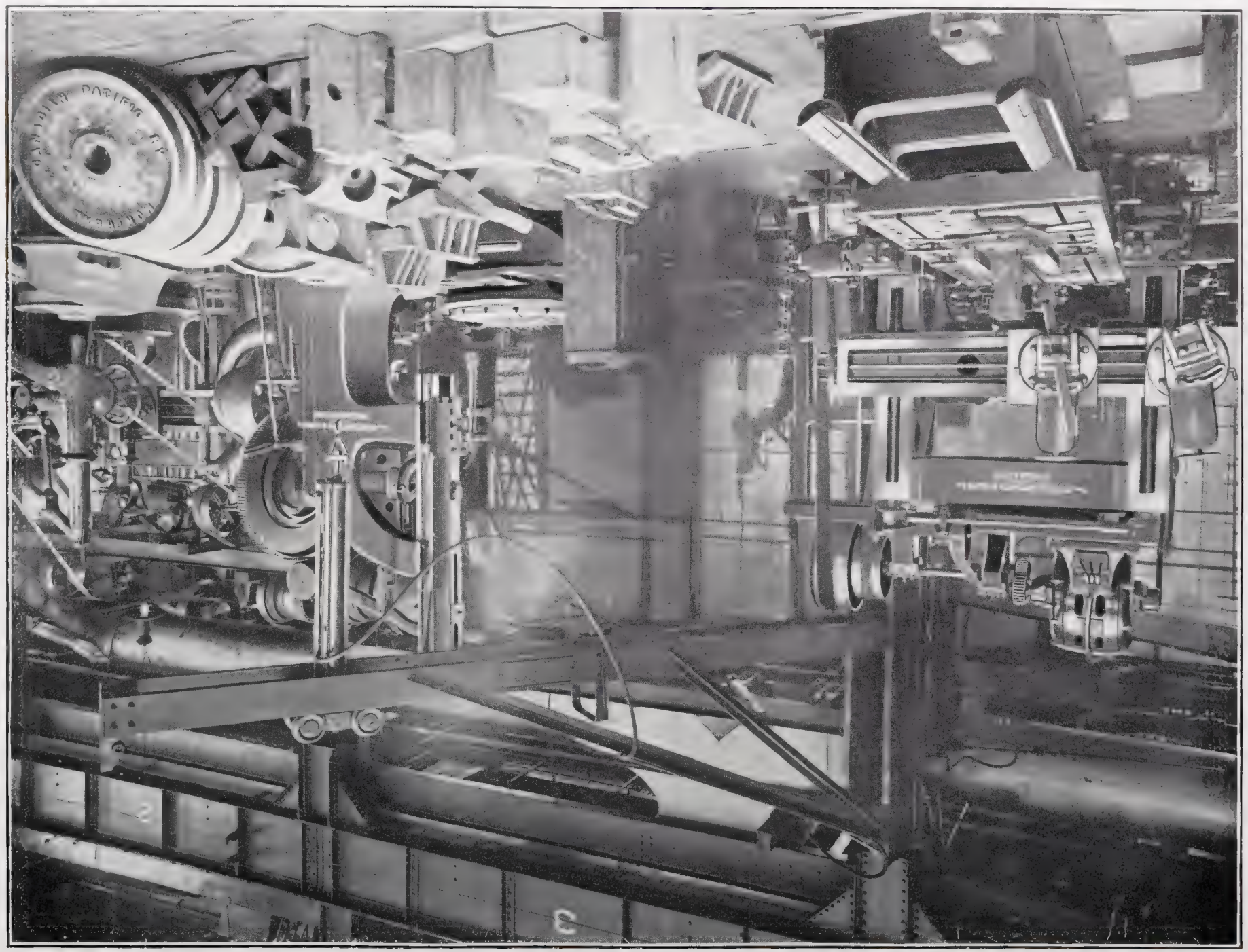

JOHN BERTRAM & SONS CO. LIMITED
DUNDAS, ONT.

SHOWING BERTRAM ROTARY PLANER

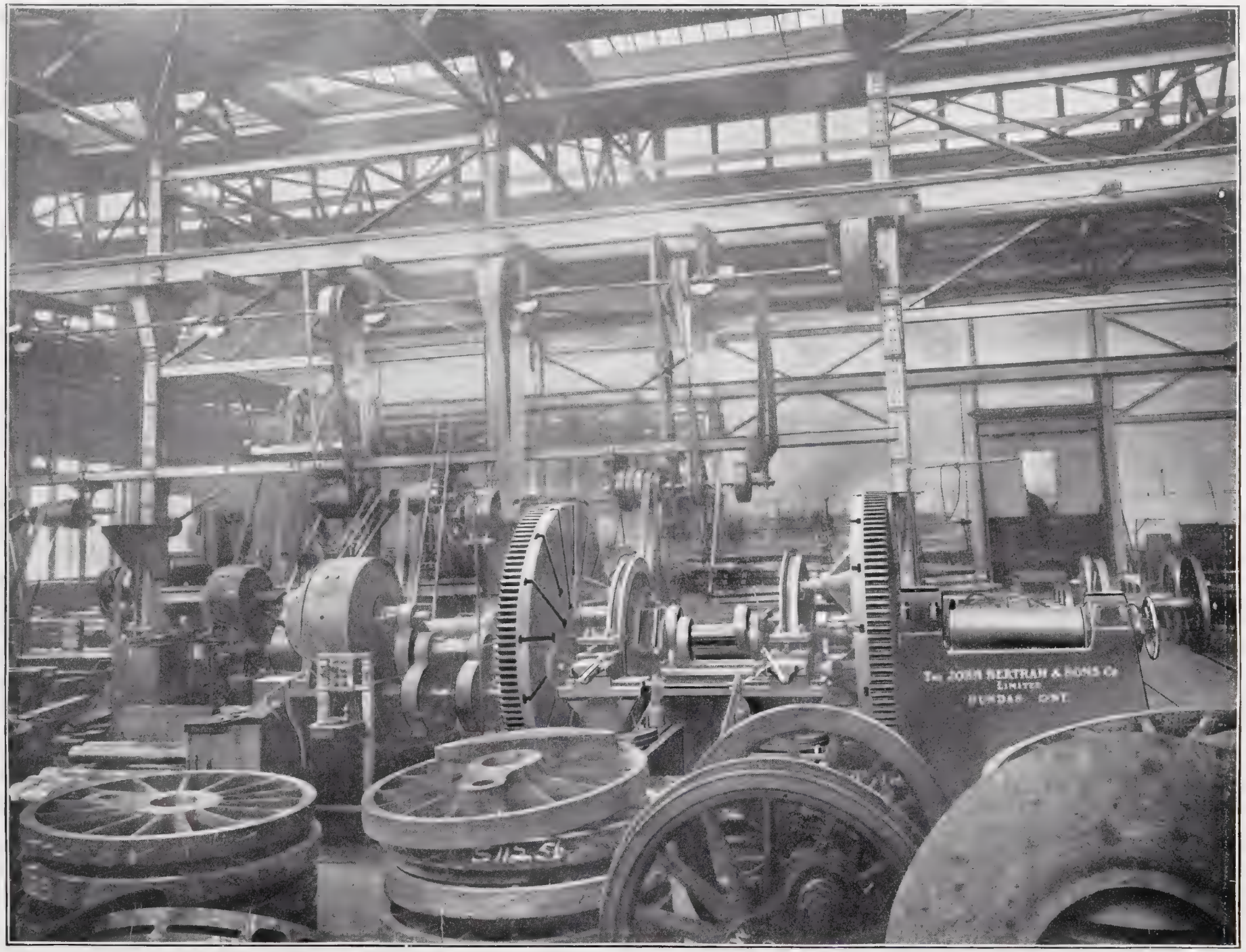








THE FORT POINT & SUMMER STREET COMPANY

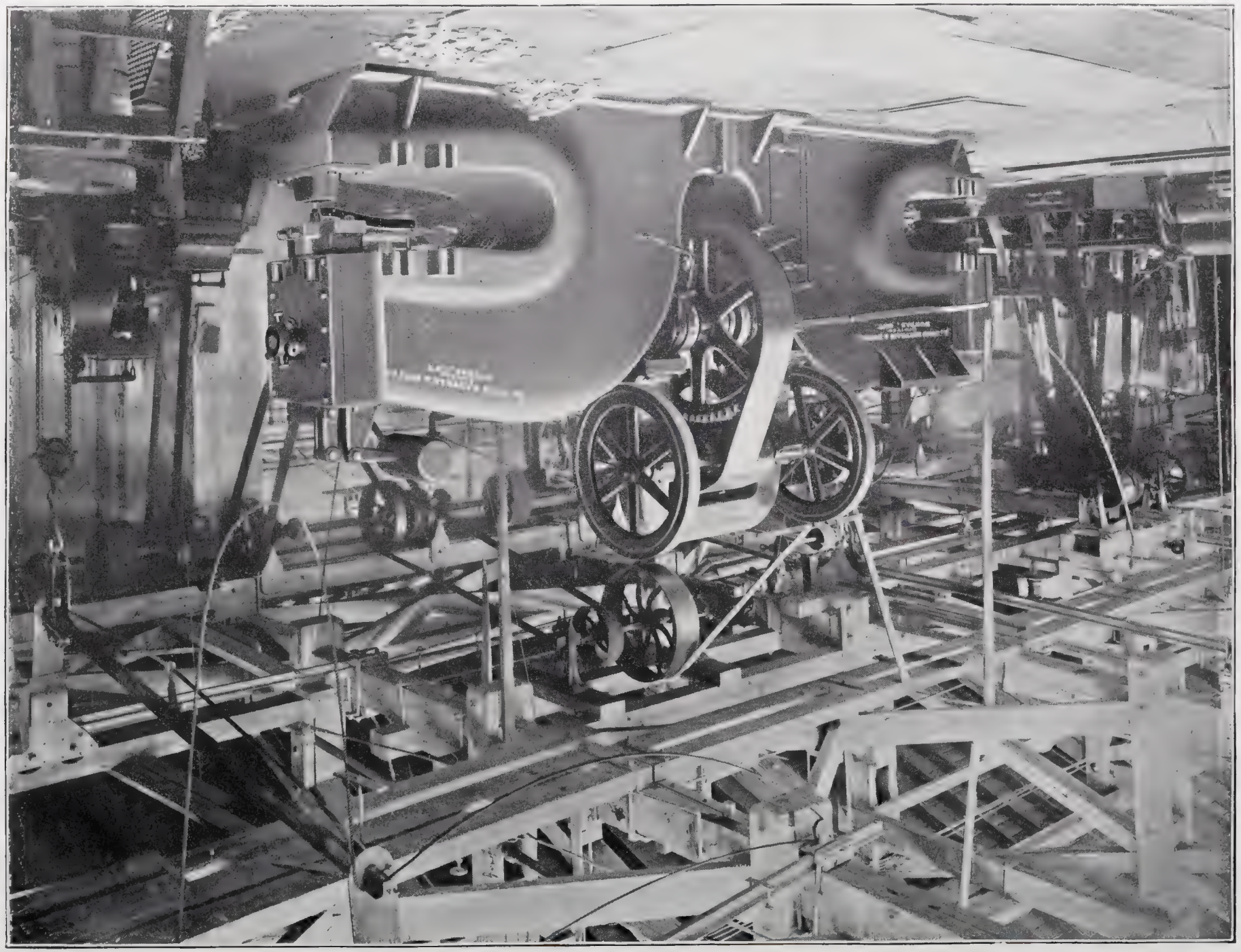


INTERIOR VIEW

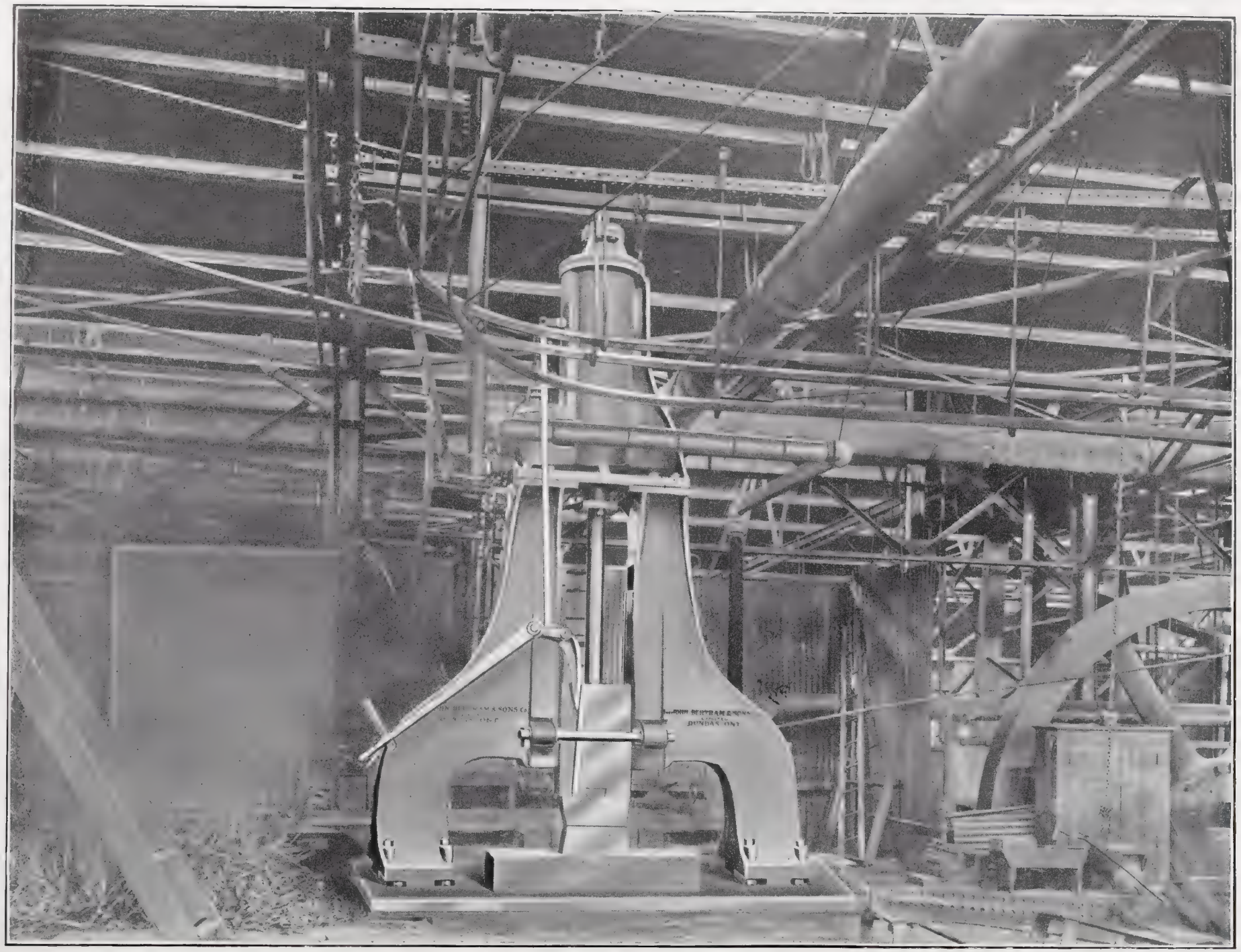
SHOWING BERTRAM [illegible] INCH WHEEL LATHE

THE JOHN BERTRAM & SONS COMPANY, LIMITED

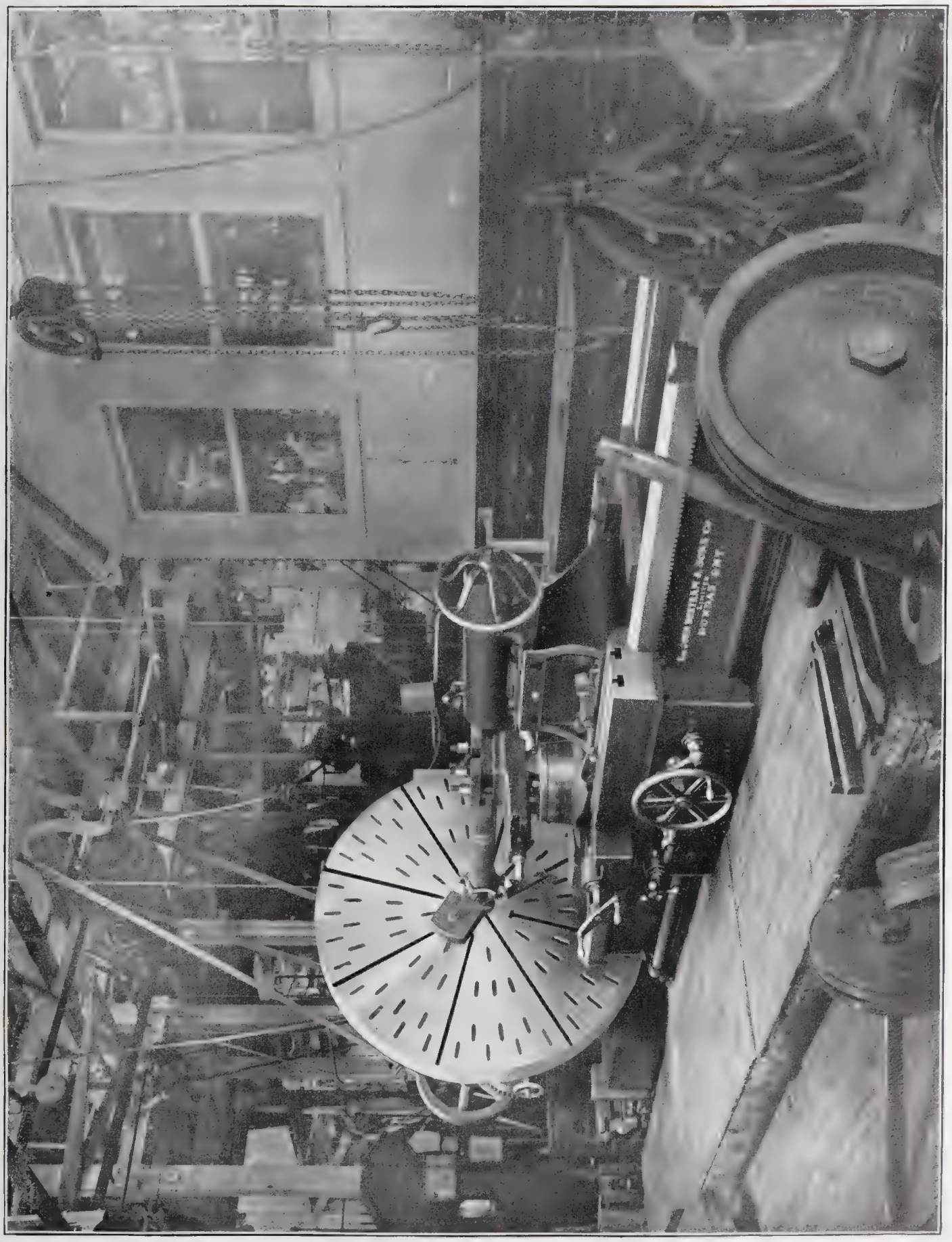
INTERIOR VIEW



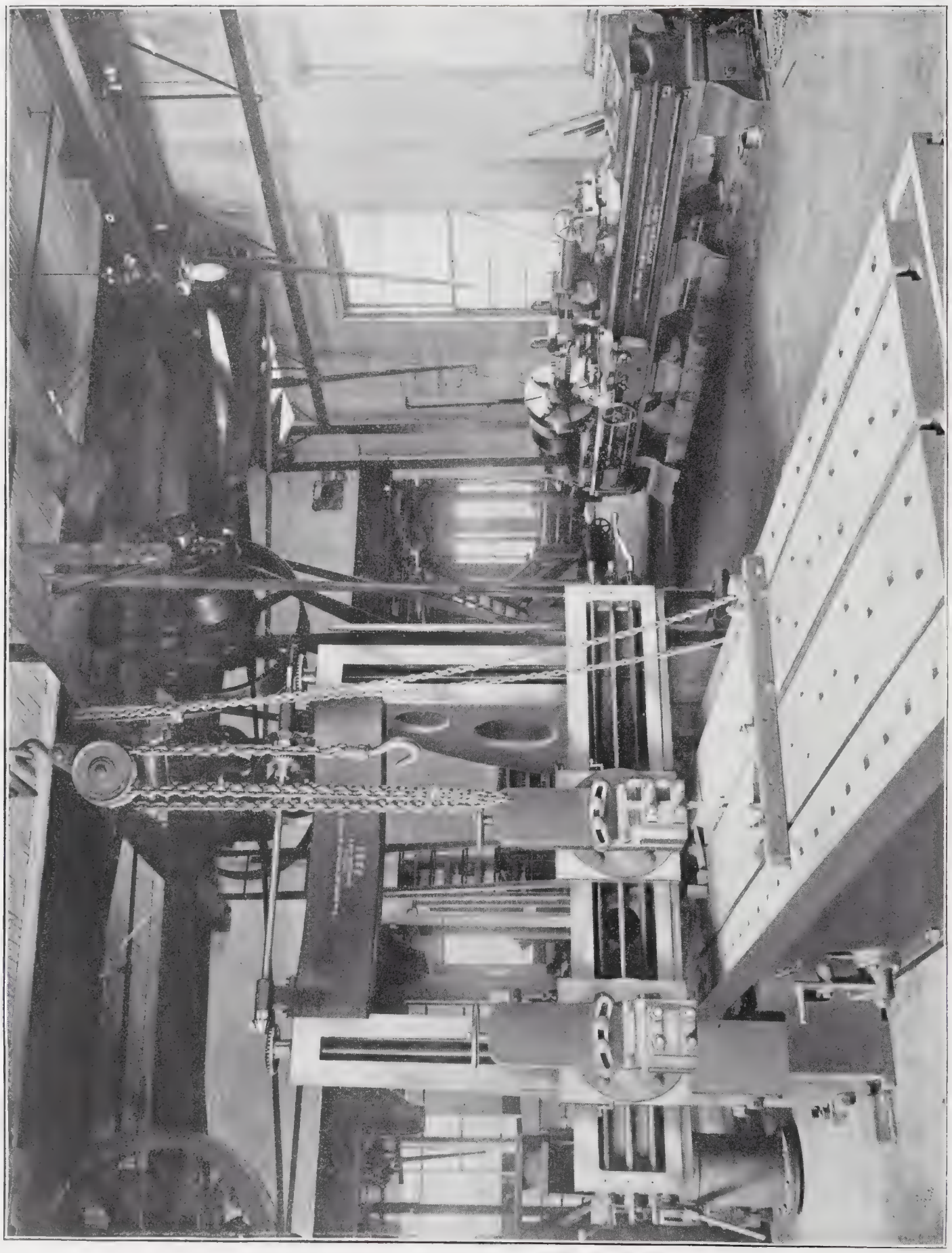
THE JOHN PEARN & SONS COMPANY LIMITED



INTERIOR VIEW
SHOWING BOTTOM BOSS OF SPINDLE FOR STEAM HAMMER



THE 100-INCH BRIDGE PLATE



SHOWING BERTRAM 48-INCH PLANER AND HIGH SPEED LATHE

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